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PD-AAB-138-A1

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT PAPER FACESHEET

1. TRANSACTION CODE: A (A ADD, C CHANGE, D DELETE) — PP

2. DOCUMENT CODE: 3

3. COUNTRY/ENTITY: NICARAGUA

4. DOCUMENT REVISION NUMBER: -

5. PROJECT NUMBER (7 digits): 524-0117 0128

6. BUREAU/OFFICE: A. SYMBOL: L.A. B. CODE: 05

7. PROJECT TITLE (Maximum 40 characters): Nutrition Improvement Program

8. ESTIMATED FY OF PROJECT COMPLETION: FY 81

9. ESTIMATED DATE OF OBLIGATION: A. INITIAL FY 77 B. QUARTER 4 (Enter 1, 2, 3, or 4) C. FINAL FY 81

10. ESTIMATED COSTS ($000 OR EQUIVALENT $1 -)

A. FUNDING SOURCE	FIRST FY 77 B. FX	C. L/C	D. TOTAL	LIFE OF PROJECT E. FX	F. L/C	G. TOTAL
AID APPROPRIATED TOTAL						
(GRANT)	(177)	(47)	(224)	(395)	(105)	(500)
(LOAN)	(1132)	(1868)	(3000)	(1394)	(1606)	(3000)
OTHER U.S. 1.						
OTHER U.S. 2.						
HOST COUNTRY					4354	4354
OTHER DONOR(S)						-
TOTALS	1309	1915	3224	1789	6065	7854

11. PROPOSED BUDGET APPROPRIATED FUNDS ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE C. GRANT	D. LOAN	E. 1ST FY 77 F. GRANT	G. LOAN	H. 2ND FY 78 I. GRANT	J. LOAN	K. 3RD FY ___ L. GRANT	M. LOAN
(1) FN	300	300	300	224	3000	276	-		
(2)									
(3)									
(4)									
TOTALS				224	3000	276	-		

A. APPROPRIATION	N. 4TH FY ___ O. GRANT	P. LOAN	Q. 5TH FY ___ R. GRANT	S. LOAN	LIFE OF PROJECT T. GRANT	U. LOAN
(1) FN					500	3000
(2)						
(3)						
(4)						
TOTALS					500	3000

12. IN-DEPTH EVALUATION SCHEDULED: MM YY 11 78

13. DATA CHANGE INDICATOR. WERE CHANGES MADE IN THE PID FACESHEET DATA, BLOCKS 12, 13, 14, OR 15 OR IN PRP FACESHEET DATA, BLOCK 12? IF YES, ATTACH CHANGED PID FACESHEET.

1 (1 NO, 2 YES)

14. ORIGINATING OFFICE CLEARANCE

SIGNATURE: [signature]

TITLE: Director USAID/Nicaragua

DATE SIGNED: MM 08 DD 10 YY 77

15. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION: MM 08 DD 12 YY 77

AID 1330-4 (3-76)

PROJECT PAPER

NICARAGUA - NUTRITION IMPROVEMENT PROGRAM

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PART ONE - PROGRAM SUMMARY AND RECOMMENDATIONS

A. Face Sheet Data. See preceding face sheet for summary of fiscal data and project purpose.

B. Recommendations. The USAID recommends authorization of both loan and grant financing for a Nutrition Improvement Program to be implemented by the Government of Nicaragua (GON). Annex I E contains the GON Letter of Application for this assistance.

1. Program Authorization. $3.5 million. The loan element of $3.0 million will be funded by a FY 1977 authorization. It is expected to finance both foreign exchange and local currency costs on approximately equal footings. Recommended terms are repayment within 30 years,* including a ten-year grace period carrying an interest rate of 2% per annum during grace and 3% thereafter.

The grant element of $500,000 represents the planned amendment-extension of the current Nutrition Grant No. 524-0117 and will be funded by allotments from FY 1977 and FY 1978. It is expected that the majority of costs to be grant-financed will be foreign exchange costs with the remainder being local currency costs. The Nicaraguan unit of currency is the Cordoba (C$) and the current rate of exchange is C$7.00 = US$1.00.

2. Program Terms and Conditions. Program funding will be subject to the terms and conditions specified in the draft Program Authorization of Annex I D.

C. Borrower/Grantee. Borrower/grantee will be the GON represented by the Interministerial Commission for Food and Nutrition (CIPAN). The CIPAN is presided by the Minister of Public Health and further comprised of the Ministers of Agriculture, Education, Economy and the Director of the National Planning Office. The Executive Secretary of CIPAN is the Director of the Technical Committee for Food and Nutrition (CTAN) which is the planning, implementing (in selected activities) and evaluation arm of CIPAN.

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* However, see Program Issue No. 1 below regarding GON request for a 40 year repayment period.

D. Program Description

1. Strategy for Integrated Rural Development. The Nutrition Improvement Program set forth in this paper constitutes priority support of the Nicaraguan strategy for integrated rural development (IRD). The strategy is to simultaneously conduct multi-sectoral programs within designated rural areas,* thereby providing the target group of resident rural poor with expanded and mutually reinforcing development resources and services and a full range of opportunities for improving their lives and modernizing their outlooks. A.I.D. support of this comprehensive IRD strategy began in mid-1975 with authorization of Rural Development Sector Loan No. 524-T-031 that has helped create the GON's new rural development institution, the Instituto de Bienestar Campesino (INVIERNO). INVIERNO's income-generating operations in program areas are now well underway and represent the first line of attack on rural poverty which is the primary determinant of malnutrition among the target group. The first annual evaluation of INVIERNO operations, conducted in late 1976, showed that interim objectives are being met and/or surpassed.

The second instance of A.I.D. support for the GON's IRD strategy consists of the Rural Health Services Program, a combined loan-grant program that was authorized in mid-1976. It is designed to extend, improve and integrate rural health coverage within the target areas in order to achieve substantial declines in the high rates of morbidity and mortality that plague the rural poor. This program has also started strongly, particularly in respect to its rural community action component being advanced by PRACS/PLANSAR.** Adequate nutrition is a primary determinant of health status, and the Nutrition Improvement Program thus represents an appropriate addition to efforts under the Rural Health Services Program. A third AID-supported program in rural education is currently pending authorization.

Based upon the experience gained under the two ongoing programs (INVIERNO and Rural Health), and strengthened by their thrust to increase rural incomes and health

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* Pacific and Central Regions II and V to start.

** PRACS is the acronym for, and unit of the Ministry of Health's rural health educators. PLANSAR is the acronym for and unit of the MOH's rural engineers. These units work in tandem.

coverage, complementary efforts under the Nutrition Improvement Program are judged to be especially promising and feasible. These efforts will support the GON's new National Food and Nutrition Plan (NFNP) (1978-1982). They will also coincide with INVIERNO and rural health operations, both geographically and (even more so) in the use of community participation mechanisms for the delivery of program benefits. The pending rural education program as well as the rural municipal development program now in preparation will similarly coincide with these programs and further advance the GON's strategy for IRD.

2. Program Goal and Purpose

a. Goal. The socio-economic goal of the program (and of the overall IRD effort) is to increase the well-being of Nicaragua's rural poor. Intermediate to that goal is this program's sector goal of improving nutrition among the rural poor by achieving declines in the incidence and prevalence of malnutrition. Nutritional deficiencies in Nicaragua have been identified in studies by the Nutrition Institute for Central America and Panama (INCAP) as well as by the GON and A.I.D. in the 1976 Nutrition Sector Assessment. Major deficiencies include protein-calorie malnutrition (PCM),* endemic goiter, anemias, and deficiencies in Vitamin A and Riboflavin.

b. Purpose. The composite purpose of the Nutrition Improvement Program is to (i) improve the food habits of, (ii) increase the availability of food to, and (iii) extend preventive and maternal and child health (MCH) services to the target group, with emphases upon pregnant/nursing women, 0 - 5 year old children** as well as the malnourished in rural areas, including low-income workers upon whose earnings the disadvantaged rural family depends.

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* Approximately 62% of the 0 - 5 year population suffers from PCM. Moreover, the average calorie intake of rural Nicaraguans has been estimated at 1980 per day, as compared with a recommended average daily requirement (FAO) of 2250 calories.

** Pregnant/nursing women and 0 - 5 year children constitute the nutritionally most-at-risk population and comprise an estimated 29% of the total Nicaraguan population.

The program is community-based and self-help oriented to the maximum extent, in accordance with the proven principles of local participation. Experience in Nicaragua, as elsewhere, shows that the provision of resources and opportunities to the target group is most effective when community people participate actively in the administration and control of those resources/opportunities. This imperative controls for both near term impact as well as for longer term attention to localized problems and to breaking down the barriers to development, a most basic of which is malnutrition.

3. Program Components. Four program components address the target group and the composite program purpose in a comprehensive multi-sectoral manner as summarized below.

a. Component One, Improving Food Habits. This Component's sub-purpose and strategy is to produce positive changes in the food, nutrition and health practices of the target group through the development and implementation of a Nutrition Education Delivery System (NEDS).* The NEDS will provide community-level nutrition education services through a variety of means, including non-formal, mass media and formal mechanisms. To assure mutual reinforcement and consistency, each delivery mechanism will draw its substance from the same basic stock of nutrition facts and concepts.** These mechanisms are briefly summarized below.

1) Non-Formal Mechanisms. Organized community-level nutrition education will be delivered to the target group in rural communities of 150 to 1,000 population through PRACS health educators (60), INVIERNO social promoters (18) as well as agricultural extension agents, private sector groups and other agents now operating in the rural sector. Emphases will be placed on the transmission of 15 to 20 basic concepts, each consisting of i) the statement of a nutritional problem and ii) a practical solution to it. In addition, it is anticipated that a "Whaddya Know Traveling Food Show" will be developed and pilot tested within larger target communities generally having populations of 1,000 - 5,000. Centered upon basic nutrition themes, the show will include light entertainment, the demonstration of simple recipes from locally available food resources, the explanation and distribution of child growth charts, etc.

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* See Figure 2, page 36, for a schematic diagram of the system.

** See Figure 1, page 33.

2) Mass Media Mechanisms. With U.S. advisory assistance, Nicaragua has pioneered in the use of short radio messages (cuñas) to promote positive health and nutrition practices among the target population. Fifteen to 20 messages will be designed and aired during the program period* to reach the estimated 65 percent of Nicaraguans owning radios, some of whom are inaccessible by other means. Posters, information pamphlets and supporting visual materials will also be developed and distributed within target communities. In further support, approximately 700 incidental "advice-givers" (e.g., religious personnel store owners, etc.) from target rural communities will be trained in the basic 15 - 20 basic nutrition facts and concepts in order to transfer correct information when convenient.

3) Formal Mechanisms. In coordination with the pending rural education program, nutrition material will be developed and integrated within the training and teaching curricula of pre-service teacher training centers. These curricula will cover grades one through six. At a minimum, some 240 rural teachers from Region V will receive in-service training in the use of these curricula. Nutrition curricula will also be developed and integrated into the National Health Delivery School scheduled to open in 1979 for the training of rural health personnel, including nurse practitioners, health educators, malaria workers, volunteer community health collaborators, parteras, (indigenous midwives), etc.

An estimated $1.39 million of A.I.D. loan funds and $175,000 of grant funds will be allocated to Component One approximately as follows. (i) Technical services for development of basic stock of nutrition facts and concepts and of NEDS curricula** and radio messages ($30,000 L, $160,000 G for external expertise). (ii) Materials production during first three years of program ($700,000 L). (iii) Commodities ($140,000 L). (iv) Training ($120,000 L). (v) Investigation of food habits ($60,000 L, $15,000 G for external expertise). (vi) "Whaddya Know Traveling Food Show" ($140,000 L for technical services and initial operating costs). (vii) Evaluation cost ($60,000 L). Inflation-contingency ($140,000 L or 11 percent of above items to be loan-financed).

The GON will finance approximately $1.1 million of Component One costs as follows. (i) Materials production during fourth year of program ($150,000). (ii) Commodities ($30,000). (iii) Training ($35,000). (iv) Investigation of food habits ($45,000). (v) Salaries and operating costs ($840,000) (exclusive of CTAN).

* Topics will include good dietary practices during pregnancy, the importance of breastfeeding, simple but nutritious recipes, etc.

** Eight separate curricula are expected to be developed.

Based upon the inputs and outputs described above, the end-of-Component One - status will be the development and installation of, and the transmission of benefits through, these nutrition education delivery mechanisms. Taken together, they will provide the target group with maximum reinforcing opportunities for improving their food habits and thus their nutritional status.

b. Component Two, Increasing Food Availability. This Component's sub-purpose and strategy is to increase the availability of food and vital nutrients to the target group with emphases upon salt iodization for goiter reduction, the development and testing of a low-cost, high protein blended food, and high priority food-increasing efforts based upon community-level, self-help measures.

1) Salt Iodization Project for Goiter Reduction. An estimated 32% of the Nicaraguan population suffers from endemic goiter due to the lack of iodine intake. The objective of this project is to reduce the prevalence of goiter as a public health problem by i) initiating a national salt iodization effort whereby all producers will be obliged to add this mineral to their product, ii) establishing an effective salt iodization control and monitoring system, and iii) establishing an evaluation system to measure project impact. The expected end-of-project-status is that the prevalence of endemic goiter will be approaching zero.

2) Development and Testing of a Low-Cost Blended Food. The objective of this element is to develop and test a low-cost, high protein blended food using locally - produced or available food crops to address the problem of inadequate protein consumption among the target population.* A carefully designed research and development (R & D) effort has been selected for program testing. It will initially focus upon the fruit of the jicaro tree as source of the blended food. The R&D effort will include: i) the analysis of availability and costs of supply; ii) pilot plant development; and iii) production and distribution. Approximately four low-cost products will be produced and tested among a large and varied enough sample of beneficiaries to obtain an adequate response on acceptance and impacts. The product selected will then be distributed on a larger scale to selected sites in Regions II and V, e.g. for use as a supplemental food for malnourished children through health centers, rural hospitals and community health/nutrition agents. Bulk form marketing will be

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* INCAP survey (1973) revealed that 15% of the population consumes less than 75% of the Recommended Daily Allowance of Protein.

conducted with an eye to cost minimization. By the end of project, the GON will have made a decision, based on solid evidence, whether to expand the production and distribution of the low-cost blended food to a national scale.

3) Pilot Projects for Food Availability. This element of Component Two will advance the development and implementation of pilot projects designed to increase the availability of food to the target group. Examples of projects to be designed and, if feasible, tested include i) rural community stores and granaries, ii) food fortification activities, iii) patio crops* development, iv) food cooperatives along with possible others such as small animal raising activities and rural aqua-culture projects. A Fund for Community Nutrition Projects will be established to support these efforts. It will also include resources to support simple irrigation schemes for rural family garden activities underway in INVIERNO communities as well as for school gardens planned under the pending rural education program. In this connection, technical assistance will be provided to the GON in strengthening its procedures for distributing food during emergency situations such as prolonged drought or flooding and resulting wide-spread crop failure.

An estimated $500,000 of A.I.D. loan funds and $100,000 of grant funds will be allocated to this Component approximately as follows. i) De minimus laboratory/monitoring equipment for goiter reduction project ($10,000L). ii) Low-cost blended food: equipment for pilot plant development ($100,000 L), technical services ($25,000 L, $25,000 G for external expertise and evaluation), and production and distribution ($75,000 L). iii) Pilot projects for food availability: technical services ($25,000 L, $50,000 G for external expertise and evaluation), Fund for Community Nutrition Projects ($125,000) plus family and school garden irrigation schemes ($90,000 L). iv) Emergency food distribution plan ($25,000 G for external expertise). v) Inflation-contingency ($50,000 L or 10% of above items to be loan-funded.)

GON inputs to Component Two are estimated at $542,000. i) GON/private sector execution of salt iodization project: equipment, iodine pre-mix and monitoring during program period $215,000). ii) GON operating costs for development and testing of the low-cost blended food ($150,000). iii) GON operating

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* Patio crops include fruit trees (e.g., mangoes, citrus) as well as perennial vegetable crops (e.g., mung beans, asparagus.)

costs (exclusive of CTAN) for pilot food availability projects, garden irrigation schemes and emergency food distribution design ($162,000). iv) Emergency food planning ($15,000)

c. Component Three, Extending Maternal and Child Health Services (MCH). This Component's sub-purpose is to improve the target group's health status. The strategy is to support community-based, nutrition related preventive health activities and extend the GON's maternal and child health (MCH) program in support of such activities. Component Three includes three elements.

1) Rural Community Nutrition Surveillance. This element will establish procedures for the weighing of 0-5 year children at the community level to i) identify those who require special nutritional attention, ii) provide ongoing screening for individual care and iii) obtain anthropometric data for the Nutrition Evaluation and Information System to be established under Component Four. PRACS health educators (60) will work with 350 rural communities targeted for assistance under the Rural Health Services Program. After receiving in-service nutrition education, the educators will be responsible for: i) training community weighers or anthropometrists to weigh children and record the results on the individual child's growth chart; ii) distribution of scales, Gomez growth charts, tape recorder-radios, and tape cassettes to those anthropometrists who successfully complete a one-week training program; iii) periodic technical supervision of anthropometrists; and iv) in-service nutrition training of rural health collaborators (initially trained under Rural Health Program) and anthropometrists in joint training sessions. Assuming an average population of 350 in the 350 target communities, some 27,000 0-5 year old children - representing 22% of the population - will benefit directly from this Component Three activity. Their parents will be able to follow the child's growth over time on the growth chart. Mothers and other community members will benefit from the nutrition content/information on the tape played by the anthropometrists.

2) Rural Community Deparasitization Campaigns.* This element will increase the nutritional impact of rural health program operations in the target 350

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* An estimated 65% of rural dwellers suffer from parasites (p.16. Nutrition Sector Assessment), although more recent MOH data indicates up to 100% infection in some rural communities.

rural communities through anti-parasite activities.* Medicine will be distributed in community campaigns in an attempt to reach all community members (to be repeated every six months) by the GON through PRACS health educators and rural health collaborators. Mebendazole an anti-parasite drug, has been a "fast-seller" under the A.I.D. partera project (Grant No. 524-239) and will be the drug utilized under this Component element. Assuming a parasite infection rate of 65% in the 350 communities, this element will benefit some 80,000 target group individuals who are infected and may carry and spread disease without ever suffering symptoms.

3) Rural Community Supporting Services. This element is designed to i) upgrade the diagnostic and therapeutic services, pertaining directly to nutrition improvement, in 37 rural health centers and eight (8) posts in the target Regions No. II and V and ii) extend their "catchment" (outreach) areas in order to reduce the incidence and prevalence of nutrition related health problems among the poor. Specific activities include i) the training of rural health nurses (using curriculum developed by the National Health Delivery School in technical collaboration with CTAN) and laboratory technicians, ii) vitamin and mineral supplementation for pre and post natal women, iii) the weighing and measuring of 0-5 year olds utilizing the Gomez Growth Chart, iv) vitamin supplementation for 0-5 year olds (based on growth chart assessment) and v) the dispensing of drugs on a referral basis to those parasite cases not cured by the anti-parasite activity in the communities.

An estimated $835,000 of A.I.D. loan funds and $75,000 of grant funds will be allocated to Component Three approximately as follows. (i) Commodities, including drugs and vitamin supplementation ($620,000 L). Training ($130,000L). (iii) Technical services ($75,000 G for external expertise). (iv) Inflation-contingency ($85,000 or 11 percent of above items to be loan-financed). The GON will finance approximately $885,000 of Component Three costs, including an estimated $250,000 in commodities (drugs) as well as about $635,000 in operating costs (exclusive of CTAN.)

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* The Rural Health Services Program is providing community organization, environmental sanitation (wells and latrines) and immunization coverage to target communities. To a large extent, Component Three "piggy backs" nutrition-related activities onto Components One and Two of the health loan.

d. Component Four, Evaluating Nutritional Impact. This Component's sub-purpose and strategy is to develop community and GON capacities to monitor nutritional status, to evaluate the effectiveness of the program in improving that status and, as necessary, to modify program activities accordingly. It comprises three elements.

1) Nutrition Evaluation and Information System (NEIS). This system will enable the CTAN to: i) obtain data on nutritional status for the design, monitoring and evaluation of program activities, including target group participation; ii) obtain "early warning signals" of potential nutrition problems in specific regions of Nicaragua; iii) provide service delivery institutions with ongoing feedback about the nutritional impact of their projects; iv) analyze and disseminate information to institutions with the potential to impact on nutritional status. The NEIS will represent CTAN's core activity.

2) Evaluation of Sector Policies on Nutrition. This element will enable the analyses of policies, laws, projects and programs (especially in the agriculture sector) whose implementation affects, directly or indirectly, the objectives and goals of the GON's five year NFNP (1978-1982) and, more specifically, affects the target group. In cooperation with the Ministry of Agriculture, Central Bank, Ministry of Economy and others, CTAN will develop a series of position papers (at least three) on such subjects for the review of CIPAN during program implementation and evaluation. It will lead to executive consideration of key policies affecting nutrition (favorably or unfavorably.)

3) Evaluation Training and Support. This element will provide for nutrition and evaluation training for rural service delivery personnel who will be implementing the program. An estimated 25 participants will thus be better equipped to offer nutrition information and evaluation services through their agencies to the target group.

An estimated $275,000 of A.I.D. loan funds and $150,000 of grant funds will be allocated to Component Four approximately as follows. i) NEIS: commodities ($20,000 L and $21,000 G for transfer of items to target communities); training seminars for rural service delivery agents and target community leaders ($72,000 G) and short nutrition planning course for planners ($10,000 G); operating

costs in establishing the NEIS ($105,000 L, $10,000 G for evaluation); technical assistance ($24,000 G). ii) Sector policy evaluation ($25,000 L and $13,000 G for external expertise and operating costs.) ii) Training costs ($100,000 L). iv) Inflation-contingency ($25,000 or 10% of above items to be loan financed.)

GON funds totalling approximately $1.827 million will be allocated to Component Four approximately as follows. i) NEIS: commodities ($7,000), training seminars for rural service delivery agents and target community members ($35,000), short nutrition planning course ($18,000) and operating costs ($182,000). ii) Sector policy evaluation ($20,000). iii) External training costs ($20,000 for participants' travel, etc.) iv) Four year CTAN budget $1,545,000.*

e. Criteria for Use of Grant Financing. Various elements of the program have been selected for grant-financing as follows.

(i) Investigative Elements. The program includes limited research, development and demonstration efforts explicitly designed for the target group. Grant funds are available to help finance the costs of technical expertise needed within these element.

(ii) Evaluative Elements. Both the GON and the target group will actively participate in periodic evaluations of program activities. Grant funds are available to facilitate target group participation in evaluations as well as to provide the assistance and expertise required to comply with A.I.D. evaluation guidelines and standards.

(iii) Other Elements. Finally, limited grant financing is available for other program elements that are assigned special priority by A.I.D. or that are needed to maximize the successful execution of loan-funded elements.

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* Allocated to Component Four for convenience. CTAN will implement selected program activities in Components One through Three as well as evaluate all program activities.

E. Financial Plan. Based upon the above-described component inputs, it is expected that A.I.D. loan and grant funds, GON counterpart resources and other inputs will be allocated to the nutrition improvement program approximately as follows.

Financial Plan
(In US$000)

Use of Funds		A.I.D. L	A.I.D. G	GON/Private Sector	TOTAL
i)	Food Habits	1,390	175	1,100	2,665
ii)	Food Availability	500	100	542	1,142
iii)	MCH Services	835	75	885	1,795
iv)	Evaluation	275	150	1,827	2,252
	TOTAL:	3,000	500	4,354	7,854

F. Summary Findings. The Nutrition Improvement Program is fully feasible and ready for implementation. Technologies to be utilized have been proven in the Nicaraguan setting. The program's preventive and community-based orientation, as well as its complementarity with ongoing rural development programs, make it especially promising and appropriate in this country.

Program cost estimates are considered reasonably firm. They are based on current market conditions and, as indicated, include contingencies for price increases. Recurring costs estimated to result from the program are judged to be sustainable by the host country.

The program meets all applicable statutory criteria. Annexes I B and I C include the Checklist of Statutory Criteria and the Mission Director's 611 Certification.

G. Program Issues

1. Repayment Period of Loan. The GON has requested the same 40 year loan amortization period that has been carried by prior A.I.D. loans to Nicaragua. A forty year term would appear justifiable not only on the basis of the GON's commitment to this essentially "software" program* but also upon its concessionary approach of delivering a variety of transfer payments through self-help community structures. While recognizing that a 30 year amortization period has been foreseen by AID/W, the USAID recommends favorable consideration of the GON's request.

2. Replication of Integrated Rural Development Program. The program's longer-term impact and coverage will depend, in large measure, upon the spread of INVIERNO, PRACS/PLANSAR and other rural development programs that reinforce, and are reinforced by, the Nutrition Improvement Program. This issue concerns the rate and efficiency by which GON agencies conduct and replicate their programs. It is a continuing concern being addressed by both the GON and USAID in the implementation of these programs. The issue also concerns the need for prompt authorization and initiation of the Rural Education Program as an integral part of these efforts.

3. Inter-Sectoral Coordination. Timely and effective execution of the Nutrition Improvement Program will require continuous, programmatic cooperation among various GON agencies. The CIPAN and CTAN have been established for this purpose. Experience to date has been positive. Moreover, the program will make maximum utilization of implementing mechanisms under existing programs. The USAID thus expects that the necessary cooperation will continue through the program period.

Finally, detailed technical and operational questions are fully treated in Parts III and IV of the paper.

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* While clearly cost-effective and economically justifiable, the program will not directly generate "financial" cash flows to assist in amortization.

H. USAID Program Committee

Bruce Blackman	Loan Officer
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Approved by: Arthur Mudge, Director

Drafted by: Blackman, Frazao, Feeney, Odle, Orr, Haverberg, Jones, Pratt

PART TWO - PROGRAM BACKGROUND

A. Introduction

The nutrition improvement program presented in this paper follows approximately nine years of United States' food donations to Nicaragua under Title II of Public Law No. 480. An estimated $15.0 million worth of PL-480 food* was donated through mid-1976 when the program was phased out, reasons for which included both U.S. agricultural market conditions in the early to mid 1970s and, of greater weight, the reckoning that this country could and should begin to shoulder more responsibility for improving the nutritional status of its population. The known determinants and deficiencies of that nutritional status were set forth in the 1976 GON/AID Nutrition Sector Assessment.

While PL-480 operations were phasing down, a new and comprehensive GON strategy for integrated rural development was phasing up. The nutrition improvement program represents a carefully designed endeavor in support of that strategy which, in brief, is to simultaneously conduct multi-sectoral programs within designated rural areas - Regions II and V to start - and, as the programs are sufficiently perfected, to spread them as quickly and efficiently as possible, thereby providing increasing numbers of Nicaragua's poor with a full range of opportunities for improving their lives and modernizing their outlooks.** A.I.D. support of this strategy formally began in mid-1975 with authorization of a $14.0 million agriculture sector loan. That loan is assisting the GON with (i) the extension of its Instituto de Bienestar Campesino (INVIERNO) and with (ii) the ongoing restructuring of its Public Agriculture Sector. A.I.D. support continued in mid-1976 with a $5.0 million loan for improving, extending and integrating rural health services, both at community and rural hospital levels. Moreover, a loan for rural education development is pending authorization and a proposed loan for rural municipal development is now in preparation. Taken together with these programmatic efforts to increase incomes among - including the transfer of more and better health, educational and other services to - the poorest segments of Nicaragua's population, a complementary and multi-disciplinary endeavor

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* Estimates of both the precise time-span and total value of PL-480 food donations in Nicaragua are difficult due to the loss of records in the 1972 earthquake.

** See Annex IIA for a general summary of the constraints addressed by, and the premises of, the strategy for integrated rural development.

to improve nutritional status is especially appropriate. Given the magnitude of undernutrition among Nicaragua's poor, such an endeavor will indeed be necessary if the poor are to take advantage of new opportunities to better their standards of living and to modernize their outlooks, and if they are to achieve subsequent, continuing gains on a self-help basis.

The nutrition improvement program has been developed by the GON over the past year with assistance from both A.I.D. and the Nutrition Institute for Central America and Panama (INCAP)*. Bi-lateral A.I.D. assistance has come through the Nutrition Program Development Grant which, coupled with over 200 person days of advisory assistance from INCAP, has helped the GON to develop a five year National Food and Nutrition Plan (NFNP) as well as an institutional mechanism to implement it. The mechanism consists of an Interministerial Commission (CIPAN)** whose executive secretary is the Director of the Technical Committee for Food and Nutrition (CTAN), a multi-disciplinary group of planners and professionals from sectors having the most impact upon nutritional status. The creation of this institutional mechanism - and the staffing of CTAN with vigorous, qualified and dedicated individuals*** - indicates the GON's interest in, and commitment to, shouldering more of the responsibility for improving nutrition among the poorer, disadvantaged segments of the Nicaraguan population.

More detailed information on the background of the nutrition improvement program is summarized below. It covers: i) a recent evaluation of PL-480 Title II Assistance to Nicaragua; ii) the Nicaragua Nutrition Sector Assessment; iii) the status of current GON/AID sector programs; iv) an evaluation of results attained under the Nutrition Program Development Grant; v) the GON's NFNP and strategy; and vi) other donor assistance. Additional data about these and related subjects may be found in the Nicaragua Nutrition Sector Assessment, the project paper supporting

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* INCAP, in turn, is receiving support from a ROCAP grant project authorized in 1976.

** Presided by the Minister of Public Health, the Commission is further comprised of the Ministers of Agriculture, Education, Economy, Industry and Commerce and the Director of the National Planning Office.

*** See further discussion of CTAN below and in Part V, Program Administration.

the Nutrition Program Development Grant, capital assistance and project papers supporting Loans No. 524-T-031 (agriculture), 524-U-032 (rural health) and the pending rural education loan, all of which are on file in AID/Washington.

B. PL-480 Title II Assistance

1. Evaluation

As part of the nutrition program development effort, a retrospective evaluation of the food donation program was conducted during February and March of 1977 to determine, to the extent possible, what lessons could be learned from it and how they might be utilized in developing new strategies and projects for nutrition improvement in Nicaragua. The evaluation was done by an A.I.D. contractor. Conclusions of the evaluation are summarized below.*

a. General Conclusions. PL-480 Title II assistance to Nicaragua totalled around 142.6 million pounds (64,680 metric tons) costing in excess of $15.0 million (Commodity Credit Component price plus ocean freight) during the 1968-76 program period. Food deliveries ended in July-August, 1976.

The reporting/evaluating systems of the various programs which utilized PL-480 commodities in Nicaragua did not provide adequate statistical information on the number of primary beneficiaries.** In 1975, however, CARITAS and World Food Program (WFP) activities are estimated to have reached 100,000 persons, 37,000 of whom were estimated to be "most-at-risk" groups, thus providing coverage for about 6% of the total number of these most vulnerable groups.*** Had the total tonnage of commodities distributed in 1975 been directed only at the 0 - 5 years and pregnant/lactating women groups, potential coverage might have been as great as 62% of the most vulnerable population.

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* The full evaluation report entitled Evaluation of Supplementary Feeding Programs in Nicaragua by Joyce King is on file in AID/W.

** The evaluator stated that incomplete reporting/evaluation systems have been a common deficiency in PL-480 Title II programs.

*** The total number of nutritionally "most-at-risk" groups - 0 - 5 year population and pregnant/nursing women - is minimally estimated at 667,000 or about 29% of Nicaragua's 2.3 million population. (Around 22% are 0-5 year olds and 7% or so are pregnant/nursing women.)

The evaluation of Food for Peace (FFP) and WFP inputs indicates a lack of statistically valid proof of nutritional impact. The programs were not designed to impact exclusively on the vulnerable groups. Since there was no baseline data collected on any of the programs' beneficiaries, no conclusions can be drawn that the programs actually improved the nutritional status of any specific population group. Neither is it known whether the present nutritional situation would have been worse, had the food not been distributed.

The program generally lacked an evaluation mechanism with the capacity to set goals in nutritional terms and then check achievements. No epidemilogical study of malnutrition was done. The information available indicates the delivery of X amount of food rations with X nutritive value. The records do not reveal either (i) how long an individual remained in a program, (ii) whether the beneficiaries suffered from malnutrition and, if so, to what degree. Some evidence of "over-programming" of food was noted, i.e., more than distribution channels could actually move at a given time.

Community projects which proved successful with food incentives included: (i) child weighing; (ii) nutritional counseling for mothers; (iii) referral of sick children; and (iv) women's clubs. The evaluation found that supplying the necessary focal point for sustained activities is a priority and a food supplement for the targeted malnourished may be the best drawing card. Further:

(i) School Feeding and Food-for-Work infrastructure represent expensive ways to reach the nutritionally most vulnerable population (0-5 year children, pregnant and lactating women.) Of the programs evaluated, the Community Nutrition Centers proved to be the most effective way to reach the most vulnerable.

(ii) The most qualified GON food handlers are CEDINA, INCEI and INFONAC.*

(iii) The private voluntary organizations (PVOs) CARE and CARITAS, have the most experience in the operations and training activities of supplemental feeding programs in Nicaragua.

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* CEDINA is the GON's National Food Warehousing and Distribution Center (not now operational); INCEI is the grain stabilization institute of the public agriculture sector; and INFONAC is a public development bank.

b. Program Coverage. 1975 was the most recent full calendar year of PL-480 operations. CARITAS' 1975 operations were studied in depth. Table I of Annex II B provides an approximation of the coverage achieved. Although complicated by the lack of orderly data, the coverage attained by the Ministry of Public Health's (MPH) supplementary feeding program was also estimated.* Table 2 of Annex II A indicates some of the coverage data compiled for 1974, 1975 and 1976. The average number of beneficiaries in the MPH program at any one time during the three (3) years studied was estimated at 9,366 0-5 year olds and 3,568 pregnant and lactating women. Most of the Centers received only Corn-Soya Blend (CSB) or Corn-Soya Milk (CSM) while some received rolled oats, flour and, on a one shot basis, milk. The number of beneficiaries receiving only CSB or CSM is not known, thus making a determination of nutritional impact impossible.

Efforts were made to estimate the coverage attained by other PL-480 Title II Programs such as the school feeding program, the applied nutrition program, food for work activities, the MOH's Nutrition Education and Rehabilitation Centers (SERNs)** and other minor programs. Estimates are contained in the evaluation report.

c. Emergency Feeding Projects. PL-480 commodities were utilized via the WFP in support of immediately post earthquake and drought projects on an emergency basis. CEDINA's project provided food for work in Managua (cleaning and rebuilding) as well as food relief for dislocated earthquake victims. In response to the 1972-73 drought, INCEI and CEDINA distributed food for work within several sub-projects including (i) National Production of Basic Grains, (ii) Comunal Works and Services for Small Farmers, (iii) Public Health for Cammunal Cooperation and (iv) Small Farmer Colonization.*** It is estimated that the GON contributed in excess of $1.0 million to these post-earthquake and drought-related projects.

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* This program moved through the Ministry's system of health centers, health posts and Mobile Units (PUMAR).

** The MOH operates a system of 14-SERNs having a capacity for approximately 450 children. Since the termination of PL-480 commodities, some of these centers have tended to be used as day care centers (guarderias).

*** Administering Offices for these sub-projects were (i) Ministry of Agriculture and the Banco Nacional, (ii) Ministry of Agriculture, (iii) Ministry of Health, and (iv) Nicaraguan Agrarian Institute.

Despite the lack of detailed and comprehensive procedures for doing so, the GON has shown a commitment and ability to take action in the face of emergency situations. Another example is the GON's support of food for work activities in late 1976, on its own, in response to the 1976 drought.* Coverage, however, was apparently quite limited.

d. Program Cost. The analysis of program cost was severely hampered by the lack of uniform or meaningful data. In-country handling costs approximated an additional 11 percent to the $15.0 million in food. The cost per daily feeding per person ranged between $.09 and $.17, depending upon the program. However, the amount of calories and proteins per supplementary feeding showed wide variations within and among programs.

Due to the insufficient data base, the evaluation was unable to make an overall judgment about the program's effectiveness, neither from cost nor benefit analyses, nor to generate other measurements of potential interest such as the program's effects, if any, upon domestic food production in Nicaragua during the program period. It was noted, however, that beneficiaries working on the Basic Grains Production Project (July 1974 - June 1976) (World Food Program) produced corn, beans, and sorghum representing around 10% of the national production of these grains during that period, with an estimated value of $21,630.315.

2. Nutrition Planning Lessons Taken

As elsewhere around the world, PL-480 Title II Assistance to Nicaragua was based upon a composite of political, emergency, humanitarian, developmental as well as nutritional purposes. Some of these purposes were successfully met.** The assistance clearly accomplished the important humanitarian aims of relief and recovery from the 1972 earthquake-drought combination. It also served developmental purposes, particularly in the food-for-work activities.*** For the reasons outlined above, however, the programs' success from a nutritional standpoint cannot be substantiated.

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* This activity was outside the scope of the evaluation.

** One was providing an outlet for surplus U.S. agricultural production.

*** One of these - INFONAC/World Food Program reforestation activities in Zelaya - is being continued by the GON on its own, reportedly through March 1978 and possibly beyond.

In charting its transition away from reliance upon U.S. food donations toward its own nutrition improvement program, GON planners have avoided two pitfalls associated with the PL-480 program. One was the inability to determine if the program really made a nutritional difference. The GON Food and Nutrition Program includes simple but effective mechanisms for determining the impact of its interventions and for modifying them on the basis of ongoing evaluation and feedback (Component Four).

Closely related to the first, the second pitfall was the centralization of the PL-480 program. Washington and Managua tended to make the decisions about the shape and levels of the program with limited reference to the needs or desires of intended Nicaraguan beneficiaries. The nutrition improvement program thus includes mechanisms to assure community level planning, participation and self-help. Experience here, as in other countries, shows that - more than those of any central authority - community-based efforts (and control) hold the most promise for assuring continual attention to, and coverage of, problems affecting community people. Indeed, this assertion is the basis of current GON/AID sector programs, the status of which is summarized below in Section D.

C. Nicaraguan Nutrition Sector Assessment

In 1966, INCAP conducted a nutrition assessment of Nicaragua which showed a high incidence of under-nutrition, the main problems being protein-calorie malnutrition (PCM), followed by deficiencies of iron, iodine, Vitamin A, and riboflavin. The 1975 update of the study, conducted by the Health Sector Analysis Division of the MOH (UASS) in collaboration with INCAP, for the Health Sector Assessment, showed little or no improvement in the situation.

Because under-nutrition is a complex, multi-disciplinary problem, it was decided to investigate it in more detail subsequent to the Health Sector Assessment, in order to analyze the problem from three main viewpoints: that of food availability, food habits and consumption, and biological utilization of foods (as a function of health status.) The 1976 Nutrition Sector Assessment (on file in AID/W) gathered data from the two studies mentioned above, from the Agriculture, Education and Health Sector Assessments, and from a number of small community studies. Findings are summarized below.

The data point to serious nutrition problems and constraints. (See Tables 1 and 2 in Annex II B.) Roughly, three out of five Nicaraguan children under the age

of five (5) suffer from some grade of PCM. Low and deficient blood iron levels were found in 24% of the urban population and 36% of the rural population. Approximately 32% of the population was affected by endemic goiter, a sympton of iodine deficiency (prevalence above 10% is considered by WHO to be a public health problem.) Vitamin A deficiencies were found in nearly 10% of the general population and in 20% of children under 10. Low riboflavin levels were found in close to 94% of the population. In these connections, mortality in children under five (5) was estimated at 32.3% of all deaths. (INCAP's classification considers mortality levels above 30% to be high.)

With respect to nutrient consumption, a survey of rural households showed intakes below 75% of the Recommended Daily Allowance (RDA) for specific nutrients as follows (see Table 3 of Annex II B): calories 32% of the sample; protein 15%*; iron 11%**, vitamin A 88%; riboflavin 57%. With respect to iodine deficiency, although most of the salt consumed is sea salt, the iodine content is lost when the water is evaporated. Since Nicaraguan soils are generally deficient in iodine, natural food iodine levels are also low.

Certain groups within the population are especially prone to nutritional deficiencies. Under-nutrition is, considering the totality of indicators, most severe in rural areas due to the relatively extreme poverty there, the seasonality of foods, frequent crop failure, low cash income, the generally adverse terms of trade in the rural sector, poor sanitation, isolation, ignorance and un-and-under-employment. In marginal urban areas, problems due to crowding, poor sanitation conditions, high cost of living, limited capacity to produce for home consumption, and limited purchasing power aggravate nutritional problems. The most-at-risk population (MARP), whether in rural or urban areas, is composed of children under 5 years of age and pregnant and nursing women since their nutritional needs are greater in quality and quantity than the general population. Closely linked to vulnerability of the MARP are the nutritional risks confronting other members of low-income Nicaraguan families, especially workers upon whose income the MARP depends.

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* When the body lacks calories, dietary protein is not as well utilized because the body, uses up protein as a source of energy. That is, the combination of calory and protein deficits (PCM) actually exacerbates the protein deficit.

** However, it is known that most of this iron comes from vegetable sources, and thus is not very well assimilated by the body.

A number of complex constraints and difficulties present barriers to nutrition improvement in Nicaragua. These are related to an understanding of the problem, actual food availability in individual communities, knowledge about and actual consumption of food, and the biological utilization of nutrients. Although now increasing, there is still limited awareness within public and private institutions about the nutritional problem and its impact on each sector's objective, and the impact of the different sector's policy, in turn, upon nutrition. In Nicaragua as elsewhere, adequate nutrition has typically been looked at as a health sector objective, rather than as a developmental goal important within each sector's plan. There are concomitant problems of reaching the disperse population, a lack of adequate information for the design of appropriate projects, and central-level planning that is often taken without reference to target group needs/desires (again, one of the pitfalls of the PL-480 program.)

At the people level, low income, lack of knowledge about proper diet, food-related taboos, poor food habits, and inequitable intrafamily distribution contribute to less than adequate food intake. The diet of the low-income population consistsmainly of white corn (tortillas), beans and rice, supplemented with plantains and tubers. Meats and dairy products are consumed in insufficient quantities and fruits and vegetables are little consumed, in general, due to custom and limited marketing and food distribution infrastructure, especially in the rural sector. Aside from the nutrition deficiencies presented by this diet pattern, there is the additional problem that small children cannot consume sufficient amounts of this bulky diet in order to satisfy their caloric/proteic needs. Moreover, poor environmental sanitation conditions, lack of potable water (see Table 2, Annex II B) high prevalence of parasitic infections (65% of rural persons 2 - 25 years old are infected with parasites)*, and inadequate preventive and curative coverage by health services are associated with poor health status and low utilization by the body of ingested nutrients.

Various casual factors serve to constrain the availability of food for consumption. Insufficient credit, limited availability of land, lack of adequate production technology, inadequate knowledge and planning related to the aspects of the food storage-preparation-marketing-distribution chain, poor sales and marketing facilities and outlets, due partly to inaccessibility on poor roads, price and export policies related with limited internal markets, high inflation rate and increasing food prices result in reduced availability of food for home consumption.

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* Nicaragua Nutrition Sector Assessment, p. 16.

High illiteracy rates, insufficient schools and teachers and the inaccessibility of many rural communities contribute to the difficulty of reaching the population with useful information and services.

Because of the complex, multi-faceted nature of the nutrition problem, there is no one solution. In fact, possible interventions must be part of a comprehensive program sustained over time with well-coordinated actions in the different sectors involved. For example, the value of nutrition education is limited if the food is not available. Nor is it useful to promote family gardens if the nearest source of water is a 15 minute walk away. Indeed, one of the main reasons for the high failure rate of activities aimed at nutrition improvement has been the lack of a global view of the objective and the absence of coordination between the sectors preventing an integrated sustained attack on malnutrition.

D. Current GON/A.I.D. Sector Programs

In sector-specific ways, current GON/AID programs are already addressing constraints to nutrition improvement in Nicaragua. Principal among these are the current Integrated Rural Development (IRD) Programs of the Ministry of Agriculture and the Ministry of Public Health, the pending rural education program of the Ministry of Public Education as well as private sector programs, including those of the Nicaraguan Development Foundation (FUNDE) and the Central Bank's Fondo Especial de Desarrollo (FED) unit. Brief summaries of the status of these efforts follow.

1. Ministry of Agriculture (MOA). The two agencies implementing Loan No. 524-T-031 are INVIERNO and DIPSA, the MOA's analysis and planning arm.

a. INVIERNO. Now in its second full year of operations, INVIERNO is aggressively pursuing its mandate to increase rural incomes and accelerate the process of total rural development in Nicaragua. Its core activity is the provision of credit and technical assistance to the country's small farm sector. To date, INVIERNO has reached approximately 5,200 small farmers and their families* with its core agricultural credit/technical assistance program and plans to reach an additional 800 small farmers during the 1977 postrera (second crop cycle.) Now operating and expanding

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* At an average family size of around six, the total number of core beneficiaries is currently about 31,200.

within Regions V and II the Institute plans to begin spreading beyond these regions in 1979-1980. With its focus upon increasing agricultural production (mostly of basic grains) and thus incomes among the rural poor, INVIERNO is attacking the most severe constraint to nutritional improvement here, namely poverty.

INVIERNO is also addressing other constraints to increasing food availability in rural Nicaragua. Closely related with its thrust toward increased production and incomes, INVIERNO is now preparing to implement a series of measures designed to improve the conditions of land tenure facing the small farm sector. These measures include a new land sale guaranty mechanism, an under-utilized land tax and more equitable guidelines for landlord-tenant relationships. While it will by no means be simple, the progressive implementation of these measures will help pave the way for ever greater income increases and modernization within the small farm sector.*

Another activity that more explicitly addresses the objective of increased food availability is INVIERNO's family garden project. Only recently started, it is being conducted on a pilot basis around San Ramon, INVIERNO's first cede (branch) in Region V. Initial self-help responses from INVIERNO clients, especially women, have been very enthusiastic and favorable. As described under Part III below, it is planned that the family garden project will be supported and advanced under the nutrition improvement program, in coordination with the school gardens project included within the pending rural education program.

Moreover, INVIERNO has recently completed a detailed study** that will lead to the establishment and testing of tiendas campesinas to be located at the cede level (starting with one on a pilot basis, probably in San Ramon). These stores

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* In turn, the USAID's proposed assistance to the GON with its Institute for Renewable Resources (IRENA) would reinforce these measures by defining best potential land use patterns in Region V as well as in the agricultural frontier of Zelaya where INVIERNO plans to spread and where the Agrarian Institute (IAN)is already operating, albeit often out of tune with the environment there.

** Entitled Estudio de Factibilidad y Desarrollo Del Proyecto Tiendas Campesinas (April, 1977), located in USAID Bulk File.

will be tested on a cooperatively owned and operated basis, with the purpose of distributing both agricultural inputs and food (basic grains) to surrounding localidades. Taken together with INCEI plans to extend its system of agencias*, INVIERNO's plans for tiendas campesinas hold promise for increasing the year-round availability of food to the rural sector at more stable prices. (See following discussion of the adverse terms of trade facing the rural poor, producer and consumer alike.)

b. DIPSA. Formerly known as UNASEC**, DIPSA is the MOA's arm for ongoing sector analysis and planning. It is currently developing proposals for a wide variety of investments to modernize the country's agriculture sector. One such proposal is for a national wholesale marketing system, including i) an improved market information and reporting sub-system, ii) better commodity grades and standards, iii) possibly a national level forward contracting sub-system as well as iv) new and improved regional markets, perhaps numbering around 10 in the Central Pacific regions and at the agricultural frontier. While a new and decentralized wholesale marketing system will particularly benefit smaller producers*** who all too often must sell to free-wheeling camioneros (truckers) at adverse terms of trade - such a system will also provide clear benefits for poor and disadvantaged consumers who all too often must buy their food from those same camioneros at exhorbitant prices****, especially between harvests. Benefits would be favorable price effects resulting from more competitive and efficient markets as well as greater availability of key foods such as fresh fruit an vegetables.*****

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* INCEI operates a chain of around 396 agencies or "poor man's stores" that sell basic grains in bulk from at generally subsidized prices. In March of 1977, INCEI announced plans to extend the system into currently unserved rural areas to provide for the outlet and internal consumption of greater quantities of basic grains.

** The agency that conducted the 1974 Nicaraguan Agriculture Sector Assessment.

*** And especially INVIERNO farmers who will be needing efficient market clearance for an aggregate supply response that is already taking off.

**** More than likely, the food has been taken to Managua, not sold (for one reason or another) and is being "re-peddled" in the rural sector.

***** The marketing system is planned to include refrigeration as well as canning, processing and other facilities.

These and other improvements in food marketing and distribution are included in the GON's draft five year NFNP (see Section F below). DIPSA planning for them will be further facilitated by the results of the Food Distribution Study currently being conducted under the Nutrition Program Development Grant (see Section E following). *

2. Ministry of Public Health (MOH). Two units within the MOH are actively participating in the IRD program. These are the PRACS and PLANSAR**.

a. PRACS. In its second year of operations, PRACS is implementing the Rural Health Services Grant Project that was approved by A.I.D. in November of 1975.*** It is a pilot effort being carried out in the northwestern department of Esteli designed to assist the MOH in establishing a model rural health delivery system for the development of community participation in the identification of health problems (including under-nutrition) and the initiation, implementation and support of community health projects to institute priority health improvements. Annex III C contains a brief description and diagram of the design of the delivery system.

Ongoing evaluations of this project have been uniformly favorable, on the basis of criteria of health improvement potential, community participation and cost effectiveness. For these reasons, and as described in Part III below, nutritional inputs will be fully integrated into the PRACS model and will be extended throughout Regions II and V under the nutrition improvement program in support of the overall IRD program.

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* It is expected that, if other donor financing is not available, then USAID assistance in putting up and together the wholesale marketing system may be proposed as part of a future agriculture development sector loan.

** PRACS is both the unit implementing, and the acronym for, the Programa Rural para Accion Comunitaria en Salud. PLANSAR is both unit and acronym for Plan Nacional para Saneamiento del Ambiente Rural.

*** See project paper supporting grant No. 524-0110. The grant is fully committed and disbursements are expected to run through mid-1978.

b. PLANSAR. PLANSAR is in its first year of operations as the cutting edge of the Rural Health Services Program. It has started strongly (see recent Monthly Loan Reports) and as of 6-30-77, was ahead of plan for 1977 and serving some 42 rural communities in Region V with its core activities of community health organization, potable water, latrinification and (to come) immunizations. It is now planned that PLANSAR will provide such services, in coordination with INVIERNO, to 350 rural communities during the four-year current program period. As shown in Part III of this paper, PLANSAR's nutrition-related coverage will be expanded under the nutrition improvement program.

c. Other priority components of the Rural Health Services Program include development of a new National Health Delivery School (NHDS) and strengthening of the rural health referral system based upon more operational and coordinated referral patterns between health facilities and upon strengthened diagnostic, therapeutic and supporting health services provided by the rural hospitals. The NHDS will improve and expand the human resource capacity of the health sector with emphasis on community health workers, primary and secondary care in rural health centers and health education. Substantial progress is already being made in the development of curricula and materials for nutrition, MCH and other coursework to be emphasized at the NHDS.

3. Ministry of Public Education (MPE). The pending Rural Education Program will also address the objective of nutrition improvement in a sector-specific way. Most explicit nutritional interventions thereunder will be i) the school gardens' activity and ii) the modernization of primary school curricula (grades 1-4), including its health and nutrition content. In addition, the program's general thrust toward extending and improving primary education coverage should favorably impact upon the nutritional status of rural Nicaraguans in the medium to longer term. The nutrition improvement program has been designed to take full advantage of these pending investments in rural education.

4. Private Sector. Besides programs moving through Nicaragua's public sector agencies, the GON and A.I.D. are supporting private sector efforts that indirectly impact upon nutritional status. With A.I.D. grant support, the Nicaraguan Development Foundation (FUNDE) is promoting the development of rural market women's cooperatives, rural small business and industry and agricultural cooperatives; more recently, FUNDE cooperatives have started developing child care coops. The thrust is to increase services available to, and incomes of, the poor, especially in rural areas.

Through the Managua reconstruction effort, the GON and A.I.D. are supporting the provision of credit and technical assistance to small, disadvantaged entrepreneurs by both private and public lenders through the FED unit of the Central Bank. Again, the objective is to increase production and income, income being a major determinant of nutritional status. As of 7-31-77, more than 1,200 small credits have been extended through the FED program*. The program's success to date has led to proposed GON-AID support in extending this private sector approach into the rural sector in support of the IRD program, particularly its upcoming Rural Municipal Development component**.

5. Taken together, the above programs and plans establish a solid base - of physical and human resources - for the implementation of a comprehensive, multisectoral nutrition improvement program. With A.I.D. and INCAP assistance, the GON has developed such a program over the past year. An evaluation of the nutrition program development effort follows.

E. Evaluation of the Nutrition Program Development Grant

Along with the Assessment, the Nutrition Program Development Grant for $400,000 was approved by A.I.D. on June 4, 1976. Its stated purpose was to "establish the preconditions necessary for the effective implementation of a National Food and Nutrition Program (NFNP)". The program supports the NFNP, and is based upon the Grant's success in accomplishing its purpose of establishing the institutional and technical capability for NFNP execution. A summary evaluation of the Nutrition Program Development Grant is presented below, using as its basis the logical framework chart that was transmitted as Annex C of the Grant Paper.

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* Another FED effort being supported by A.I.D. is the Pilot Credit Guaranty Project. Now getting underway, this private sector effort will help stimulate the flow of private credit to marginal borrowers, including small agricultural, group and business producers.

** See project identification document for Secondary Urban Centers proposal in USAID's FY 1979 ABS.

1. Project Inputs

No major problems were encountered in obtaining the project inputs when needed*, although some minor problems arose. Due to the large amount of technical assistance being provided by both INCAP and A.I.D., coordinating the arrival of consultants to maximize their effectiveness was difficult. On the INCAP side, the demands of programs in other Central American countries had to be met. On two occasions, USAID/Nicaragua had difficulties in meeting targeted dates for the arrival of consultants and commodities when the contracting or procurement** was being done by AID/W. Delay was also experienced in the local contracting of a consulting firm to perform the study of the Nicaraguan Food Distribution System. Preparing the terms of reference, soliciting proposals, and negotiating the contract took four months longer than originally planned, with the result that the final report will not be ready until November 1977***. This process did, however, provide the newly established CTAN with some initial contracting experience.

Inputs from the GON all appear to have been made on a timely basis. This is also true of the contribution of staff time. However, the input of staff time from the public agricultural sector was provided somewhat slowly due, at least in part, to the heavy workload in DIPSA. In general, the quality of staff appointed to CTAN has been excellent. (See Part V A for description of CTAN staffing arrangements.)

2. Project Outputs

a. Output One - Nutrition Planners Trained

Training of CTAN members tended to be more on-the-job than had been anticipated when the Grant paper was written. The GON took the position,

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* See Annex II C for summary of GON inputs during the program development period.

** Particularly slow has been procurement of equipment needed for INCAP's field survey to update its measure of the incidence of endemic goiter.

*** The contract was signed by CTAN and the Puerto Rico - based firm of Clapp and Mayne in early July. Its outputs will feed into the above mentioned DIPSA planning for the Assembly Points Marketing System. See Annex II D for the study's Scope of Work.

supported by the USAID, that it was better to have the CTAN members immersed in the planning process along with the technical advisors rather than have them off taking formal courses during the crucial early development stage of the NFNP. Beside on-the-job training, there were the following additional activities. The full time physician assigned to the CTAN received three months of multi-disciplinary training in nutrition and another received short-term training in Mexico in nuclear medicine for the ongoing survey on goiter prevalence. One person is being sent to Washington and New York to be trained as the CTAN's mass-media specialist. In addition, a Nicaraguan who speaks Miskito, the language of the Atlantic Coast Indians, is receiving long-term training in Nutrition. The Director of CTAN as well as other members have also participated in various international nutrition conferences, including the International Symposium on Nutrition Planning at the University of California Berkeley and conferences in Colombia and Venezuela. The CTAN Nutritionist plans to attend an International Conference on Nutrition Education in early September.

In November of 1976, CTAN organized and conducted a two-day conference in Chinandega, Nicaragua at which 35 government officials responsible for programs with direct and indirect nutritional impact were further sensitized to Nicaragua's nutritional problems. No other in-country nutrition conferences or seminars have been held, although future seminars are planned.

b. Output Two - Feasibility Studies, Surveys, Evaluations and Project Designs Completed

i) Design of a National Nutrition Surveillance System. The CTAN developed a programmatic concept of what will constitute the Nutrition Evaluation and Information Service. (See Part III, Component Four.) Development of the system coincided with the actual design of nutrition interventions to be implemented as part of the NFNP. To establish baseline data, a pilot nutrition survey was conducted in May of 1977. A larger survey in Regions II and V will be conducted in August and September.

ii) Mass Media Nutrition Project Expanded, Tested and Designed. Evaluation of the earlier super limonada campaign showed that the mass

media was an effective tool to influence nutritional habits*. Following from this experience, seven new nutrition messages were designed for execution under the NFNP. (See Part III, Component One.) (Others will be developed during the program period.)

iii) School and Community Nutrition Education. Technical advisors prepared a report for the CTAN which covered potential and informal nutrition education delivery mechanisms and analyzed them in terms of their appropriateness for the particular target group or change agent, as the case may be. This study helped form the basis for the nutrition education activities of Component One of the program.

iv) Assessment of Nutrition Manpower Availability and Design of Training Plan. This activity largely coincided with the immediately preceding design activity (iii). Limited additional assistance will be provided to CTAN by an advisor scheduled to arrive in August of 1977.

v) Vitamin A Fortification of Sugar. This possible intervention has not been assigned priority in the near term. Due to the use of INCAP and CTAN resources in developing priority projects for near-term implementation, new surveys to update the data on the incidence of Vitamin A deficiency that was collected by INCAP in their 1966 nutrition studies were not conducted. Higher priority has been placed on PCM than on Vitamin A deficiency. Thus, in the near-term, the NFNP will address Vitamin A deficiencies through efforts to improve food habits and family gardens. Also, fortification schemes will be investigated and developed under Component Two of the program.

vi) Iodization of Salt. The various related studies have not yet been completed, although the CTAN intends to collect the baseline data on the prevalence of goiter as soon as the delayed iodine scanners are received. INCAP

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* Analysis of data collected after five months of broadcasting super limonada commercials showed that the number of people who had heard of super limonada increased from 0% to 88%. Super limonada was spontaneously mentioned as being given when the child had diarrhea (as medicine, from 0% to 9%, as a food to 14%). An additional message in the commercial, to continue breastfeeding during diarrhea, seemed to result in the increased percentage of mothers who did not stop breastfeeding (from 82% to 91%).

is currently conducting salt consumption surveys. On the basis of known and forthcoming data, salt iodization will be a regulatory intervention under Component Two to reduce the high incidence of endemic goiter*.

vii) Low-Cost Blended Food Product. CTAN and INCAP collaboration for this potential intervention has identified jicaro, a fruit that grows on poor soils, as a promising source for a nutritious low-cost blended food product. Acceptability of such a product appears positive because jicaro is already being marketed commercially as orchata (a convenience mix for beverage). The nutritive value of jicaro has been verified in INCAP's laboratories and prefeasibility work has been accomplished, but the feasibility of promoting the commercialization of jicaro for the target group remains to be established in terms of the costs of production and distribution. A detailed research and development effort has thus been designed for inclusion in the program (Component Two.)

viii) Evaluation of Supplementary Feeding Programs. This evaluation was accomplished within the data constraints. See Section B above.

ix) Food Distribution Analysis. Contracted late, this study should be completed in November 1977. It will provide valuable planning information to both DIPSA and CTAN.

x) Design of Sub-Project for the Integration of Nutrition into Rural Development Program. Considerable study of ongoing and proposed rural development programs was carried out by various INCAP and A.I.D.-financed advisors. The program design for Component One reflects many of the recommendations made by these consultants.

xi) Other Studies.

- Women as Change Agents. The comprehensive program design takes full and appropriate consideration of the role of women as change agents. A specific or discrete study was not considered necessary.

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* In this regard, CTAN has planned and will evaluate this initial regulatory intervention. Success with it may lead to further planning and implementation of regulatory interventions of known benefit to the target group.

- Immunological Profile Study. The tentative idea of doing this study was dropped as being too costly in view of the questionable benefit of the study.

- Weight and Height Study. This type of study was actually planned by CTAN for the inclusion of weight chart activities in the program. Also the pilot survey collected weight and height data as will the forthcoming larger survey.

- Evaluation of Impact of Distribution of Iron Tablets. This evaluation was conducted by CTAN in planning for the expansion of this activity under Component Three in order to address iron deficiency anemias among pregnant women. The activity was found to be an effective, preventive measure, but one of very limited coverage. It will be expanded at the community level through the MCH program of the MPH.

Annex II C contains a listing of the consultant reports prepared in the process of producing the substance of Output Two.

c. Output Three -- Policy Proposal Prepared

The policy proposal was prepared by CTAN and is contained in Annex II F. It contains a short summary of the nutrition problem in Nicaragua and presents the broad policy objectives of sectors impacting upon nutrition. The strategy section of the policy statement is quite brief and general. The more detailed strategy as well as project descriptions are included in the NFNP, rather than the policy. The policy document mentions the objective of establishing an intersectorial mechanism to carry out the policy. The descriptions of the mechanism and its role are contained in a decree that was published in "La Gaceta" the official GON publication.

3. Project Purpose - Progress Toward Planned End of Project Status (EOPS)

a. EOPS-1: "National Food and Nutrition Policy without loss of any essential elements approved by executive and becomes official GON policy". In late 1976, the Minister of Health transmitted a copy of the Policy document approved by the President. The approval of the President makes it the official GON policy. The very general nature of the document, however, makes it difficult to determine if

the Policy, by itself, serves to "focus support and provide long-term guidance for the NFNP". Such a judgment is more properly based upon (i) the concrete project proposals contained in the NFNP and (ii) the institutional arrangements for implementing them - as are judgments about the GON's commitment to nutrition improvement.

b. EOPS-2: "Commission established, with sufficient authority to oversee planning and coordination of NFNP, and Technical Committee established with competent multisectoral staff and programming and evaluation capacity." On April 23, 1977, the formal establishment of the Intersectorial Commission for Food and Nutrition (CIPAN), supported by a Technical Committee for Food and Nutrition (CTAN) was announced by the publication of an Executive Decree in "La Gaceta." (See Annex II G.) The CIPAN is vested by the decree with the responsibility and authority to propose and elaborate the NFNP to the President of the Republic and to coordinate and evaluate the execution of the program components of the NFNP. The Commission is composed of the Ministers of Health, Agriculture, Education, Economy, Industry and Commerce, and the Director of the National Planning Office, with the Minister of Health as the presiding member. The decree also establishes that the budget for the CIPAN and CTAN will be included as part of the budget of the Ministry of Health. The authority of the CIPAN in the area of nutrition is clearly as broad and as definitive as had been envisioned when the Grant paper was written.

The technical capacity of the CTAN has developed considerably, but to fully be capable of the job of "continuous planning, coordination, and evaluation of the NFNP" the staff will have to be expanded as is presently planned. The CTAN's performance and experience to date in coordinating and cooperating with other GON agencies have been very encouraging. CTAN has led and catalyzed active participation from numerous GON agencies - Ministries of Health, Education, Agriculture, including INVIERNO - in planning the NFNP. It can be reasonably expected that CTAN's ability to coordinate and cooperate with other GON agencies will continue to improve with experience.

c. EOPS-3: "Plan will contain at least i) course of action for implementation of policy, ii) detailed plans for priority interventions, iii) manpower training plan tailored to planned interventions, iv) financial plan which identifies short-term and long-term NFNP costs and sources of funding, v) evaluation plan, and vi) delineation of what portion of NFNP to be proposed for A.I.D. funding".

The GON has prepared a five year (1978-1982) NFNP, the initial and priority parts of which are comprised by the Nutrition Improvement Program presented in this paper. Section F immediately following summarizes the NFNP and its strategies. Then, Parts III and IV of this paper describe and analyze the Nutrition Improvement Program, while Part V explains how it will be administered. The program has been jointly developed by CTAN and the USAID. Taken together, Parts III, IV and V of this paper thus contain the collaborative "Plan" envisioned as EOPS-3.

4. Conclusion

On the basis of the above, it is clear that the Grant has been carried out essentially as planned and that its composite project purpose has been accomplished. Annex II H shows the current financial status of the Nutrition Program Development Grant.

F. GON National Food and Nutrition Plan, Strategies and Implementation

1. National Food and Nutrition Plan (NFNP) (1978-1982)*

During the program development period, CTAN elaborated a five year NFNP with initial assistance from INCAP and follow-up assistance from an AID-funded advisor. The NFNP is expected to be formally approved by the CIPAN in latter 1977. Its draft content, not anticipated to change much, is summarized as follows.

The main objective of the NFNP is sustained improvement in the nutritional status of the population in general, by means of integrated interventions addressing the determinants of malnutrition. In the short-term, those groups of the population most vulnerable to malnutrition (children under 5-years of age, pregnant and lactating women) will be given priority attention. For the medium- to longer term, those institutions directly or indirectly related to nutrition will incorporate into their plans and programs nutritional components related to the availability, consumption and biological utilization of foods.

2. NFNP Strategies

Based on the complexity of the problem and the knowledge that omission of one measure could limit the desired overall effect upon nutrition improvement,

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* Located in USAID bulk file.

NFNP strategies are oriented toward integrated improvements in the areas of food availability, food habits and consumption, and biological utilization of food. Specific strategies and interventions have been designed to impact on the different determinants of malnutrition. Strategies are divided into short-term (1-3 years) and medium to longer tenn (up to 10 years) and represent an effort to maintain equilibrium between economic, social and cultural factors.

Although initial implementation for most interventions will support the GON's general strategy for Integrated Rural Development, the medium term objective is to obtain national coverage.

Specific strategies include:

a. Short Term

(i) Improvement of the production systems and in consumption in rural areas, by means of changes in inputs and credit availability; appropriate technology and price stability; and education on nutritional value of foods.

(ii) Simple changes in consumption patterns, especially referring to food purchases and intrafamily distribution, by means of non-formal nutrition education and mass media.

(iii) Improvements in the food marketing and distribution system through policies affecting marketing and home consumption.

(iv) Motivation for the production and distribution of a low-cost vegetable food blend for domestic consumption.

(v) Improvements in food quality through fortification, using vegetable blend mentioned above.

(vi) Changes in the expenditure patterns of health services, putting greater emphasis on preventive rather than curative services.

(vii) Initial improvements in personnel training, information-gathering, research and planning mechanisms, by means of the nutrition evaluation and information service and a training program.

(viii) Iodization of salt by means of implementing related law.

b. Medium to Longer Term

(i) Significant changes in consumption patterns by means of the educational process (formal, non-formal, mass-media).

(ii) Continued improvements in training of personnel, information-processing, research and planning.

(iii) Continued emphasis on preventive health services.

(iv) Increased incomes, especially in the rural sector.

(v) Improved land utilization and resources for the production of basic food stuffs for internal consumption by means of Production and Marketing Programs.

(vi) Improvements in housing conditions especially in the rural areas.

(vii) Use of new technology for production and processing of foods.

Within the setting of its comprehensive strategy for IRD, these strategies represent an explicit GON commitment to improving nutritional status among those vulnerable to, or suffering from, malnutrition in Nicaragua. USAID supports the rural thrust of these strategies and has collaborated closely with the CIPAN-CTAN in the design of programmatic efforts to carry them out. The program thus includes those inter-related components mutually judged as most promising and feasible for improving nutritional status.

c. NFNP Implementation

The CTAN will be responsible for: monitoring the nutritional situation in Nicaragua and any changes in it; provide technical assistance with respect

to the nutritional implications of the policies in the different sectors; study and recommend nutrition programs for integration into the NFNP; set priorities and based upon these, make recommendations to CIPAN; serve as coordinating body for all GON (and some private) agencies carrying out programs related to nutrition; and supervise the implementation of the NFNP, with periodical evaluations.

To implement the NFNP, a coordinating mechanism has been established, consisting of the following elements.

(i) The Executive will be responsible for providing political support for the NFNP.

(ii) The National Planning Council (CONAPLAN) as the advisory arm to the Executive will maintain direct ties with the Executive and CIPAN, regarding the NFNP.

(iii) CIPAN, assisted by CTAN, will provide for the necessary studies in order to analyze, propose, implement, and evaluate all NFNP activities.

(iv) As head of the various public sectors (Agriculture, Health, Education, Economy and Planning), CIPAN agencies (assisted by CTAN) will implement NFNP activities.

(v) Certain target groups within the Nicaraguan population will be the beneficiaries of the NFNP. Success of the NFNP in serving the target groups will be evaluated by CTAN and reported to CIPAN, CONAPLAN and the Executive.

Annex II-1 contains a diagram of the relationship between these elements of NFNP.

G. Other Donor Assistance

The nutrition improvement program complements, and is complemented by, the assistance of other donors in Nicaragua, including international lending institutions, international technical assistance agencies as well as private voluntary organizations

(PVOs). Sector-specific efforts of other donors have been described in the USAID's DAP that was approved in mid-1977 as well as in recent project papers, including those supporting Rural Development Sector Loan No. 524-T-031, Rural Health Services Loan No. 524-U-032 and the pending Rural Education Program. (See the DAP and those project papers for further details.)

As do the current AID-supported rural development programs, other donor efforts enhance the feasibility of the multi-disciplinary effort to improve nutritional status. This is especially true with two loan programs currently being negotiated by the GON with multi-lateral lending institutions. The National Hospital System (JNAPS) is currently finalizing its application to the IDB for a large loan to finance hospital facilities and improvements as well as the extension of health posts into communities not now served by these facilities of basic level health care. For its part, the Ministry of Public Health is now finalizing its application to the IBRD for a loan to extend PLANSAR's basic environmental sanitation activities beyond the regions being addressed by PLANSAR under Component One of A.I.D.'s Rural Health Services Loan No. 524-U-032. If approved, these two loan programs will further advance both preventive and curative health coverage available to rural Nicaraguans and thus help provide a solid basis for the replication of, and assure maximum impact by the nutrition improvement program.

International technical assistance agencies and private voluntary organizations have assisted in the design of the Nutrition Improvement Program. INCAP's important role has been described above in Section E. The Pan American Health Organization (PAHO) has also participated actively in designing the program. In this regard, the U.S. Peace Corps continues to provide qualified community health and nutrition workers. (One of these is now assisting the CTAN.)

PVOs such as PROVADENIC, CEPAD, CARE and other groups continue to conduct their low-cost, self-help activities in community development at the local level. Such activities include basic preventive and curative health services, cooperative and group development, day care centers, skills training and other grass roots activities. In fact, the success of PVO efforts has helped demonstrate the effectiveness of the community participation mechanisms upon which the nutrition improvement program is based.

PART THREE - PROGRAM DESCRIPTION

A. Program Beneficiaries

1. Nutritional Profile. Profiled in the Nutrition Assessment, the intended beneficiaries of the program consist of the poor majority who are defined - in nutritional and epidemiological terms - as those suffering from, or vulnerable to, protein calorie malnutrition (PCM), anemias, endemic goiter, Vitamin A deficiency, deficiency of riboflavin as well as dental caries and other manifestations of malnutrition. (See Annex II B anew for tabulations of the magnitude of malnutrition in Nicaragua.) In its NFNP and the design of this nutrition improvement program, the GON identifies the primary target group as pregnant/lactating women and 0-5 year children (the nutritionally Most At Risk Population)* as well as the under-nourished in rural areas, including low-income workers upon whose earnings the MARP depends in the family setting. The target group to be addressed by the program in the first (and narrowest) instance will be the rural poor inhabitants of Geographic Regions II and V, defined as 77% of the population living outside departmental capitals with estimated annual cash incomes of $120 or less. They number around 330,000, including an estimated MARP element of 92,400. The average calorie intake of all rural Nicaraguans has been estimated at 1980 per day, as compared with a recommended average daily requirement (FAO) of 2250 calories.**

2. Socio-Economic Profile. Taken together, GON/AID sector assessments and project papers and the recently approved DAP*** provide a composite socio-economic profile of Nicaragua's rural poor in Regions II and V. The profile includes i) the annual income dimension ($120 or less per capita), ii) the agriculture dimension (e.g. inequitable land tenure and subsistence arrangements), iii) the health status

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* To be denoted as MARP heretoforth.

** As further compared with an average U.S. daily intake in excess of 3000 calories.

*** For further detailed information, see these assessments, project paper and DAP documents.

dimension (e.g. low rates of health coverage and concomitant high rates of morbidity and mortality that are due, in large measure, to malnutrition), iv) the educational dimension (e.g. 6% of school-age children enrolled in Region V), as well as numerous other social and economic sub-dimensions. The profile is one of unforgiving poverty and a lack of access to even minimally adequate social services.

B. Program Goals and Purposes

1. Goals. The program's socio-economic goal is to increase the well-being of Nicaragua's poor majority, especially the rural poor*. Intermediate to it, the nutrition sector goal is to improve nutritional status by achieving declines in the incidence and prevalence of nutrition, including PCM and other deficiencies among the target group as noted above and in the Nutrition Sector Assessment.

2. Purposes. The program's composite purpose is to improve the food habits of, increase the availability of food to, and extend maternal and child health (MCH) and related services to, the target group. Four program components address the program purpose and the sector goal of nutrition improvement as follows:

a. Component One, Improving Food Habits. Deliver nutrition education services to the target group utilizing a variety of techniques - including nonformal, mass media and formal education - that are designed to better family food and nutrition habits.

b. Component Two, Increasing Food Availability. Increase the availability of food and vital nutrients to the target group with emphases upon: regulatory intervention (salt iodization for goiter reduction); research, development and testing of a low cost blended food; and high priority pilot food-increasing efforts involving community-level, self-help measures.

c. Component Three, Extending MCH and Related Community Services. Improve the target group's nutritional status (especially the MARP's) through community-based preventive health projects and by improving and extending the GON's maternal and child health (MCH) program in support of such projects.

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* While directly focused upon the rural poor, program technologies will also address nutritional deficiencies within the marginal urban population. Examples include mass media nutrition education, salt iodization (a national level intervention directed at endemic goiter) and development of a low-cost, high-protein blended food.

d. Component Four, Evaluating Nutritional Impact. Develop community and GON capacity to monitor the target group's nutritional status, to evaluate the effectiveness of the program in improving that status and, as necessary, to modify the program accordingly.

Chapter descriptions of these program components in Section C below show the mechanisms by which nutrition benefits will be transmitted to the target group, along with the estimated coverage of those benefits.

Section C, Component One, Improving Food Habits

1. Constraint to Nutrition Improvement

Malnutrition is caused by the lack of one or more nutritional elements needed for adequate physiological status. Its most tangible causes are i) intake deficiencies and ii) inadequate metabolic utilization of intake. Intake deficiencies are generally due to lack of food (quantity and quality) among the target group, a constraint that is partially addressed by Component Two of the program. Inadequate utilization of intake is due to poor health status (e.g., enteritis, parasitism, etc.) a constraint to be addressed by Component Three. Although variables associated with intake deficiencies are often beyond the effective control of the individual who suffers from, or is at risk of, malnutrition, many depend upon food habits. These include perceptions about food attractiveness (as culturally and personally defined), methods of food preparation, preferences in food selection, knowledge of nutritional and health needs, culturally or family-determined distribution and intake of certain foods, etc. Component One of the program addresses food habits among the target group and is based upon the potential for improving them.

Food consumption patterns among the Nicaraguan poor normally include three meals a day. A few foods are consumed on a regular basis, including maize (as tortillas and pinol*), beans, rice, with small quantities of animal protein foods (cheese, milk, eggs, and meat) sometimes added as available. Coffee, with sugar, is a common beverage. Plantain, bananas and guineo are eaten next in frequency, along with bread and root crops such as yuca**, quiquisque***, and potatoes. Fresh fruits are not eaten frequently, with the exception apparently of mangoes when is season. Garden vegetables other than onions are not consumed often. When they are eaten, it is usually as a condiment, seasoning or small side-dish.

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* Pinol is a drink made of ground maize, cocoa, sugar and water.

** Yuca = manioc

*** Quiquisque is tuber, similar to yuca.

The pattern of food distribution within the household is apparently not equal, especially when high-valued foods are in scarce supply. The adult men of a household seem to be given preference in the distribution of animal protein foods and even of vegetables. Data also indicate the probability that, when there are household shortages of staples, adult men (workers upon whose income the MARP generally depends) are given preference in the quantity of foods consumed.

The hot/cold system of food classification is accepted by many poor people in Nicaragua, although there is a good deal of variation, among individuals and locales, in how particular foods are classified. (See Annex III C).* Because pregnancy is a "hot" condition, it is believed that a pregnant women ought to avoid or minimize intake of very "hot" foods. Further, some foods are believed to cause gas (beans, rice, yuca, plantain), stomach irritation or weakening of the blood (mangoes and citrus fruits). Nausea is sometimes associated with eating eggs, and intake of fresh fruits may sometimes be restricted due to the belief that, if fruits are eaten in excess, their "cold" qualifities may cause the development of a "cold" illness in the fetus. Lactating women and young children have even more restrictions placed on their intakes. During the post-partum period - for anywhere between 1 to 6 weeks - many women apparently eat only tortillas, pinol and pinolillo (a toasted maize drink), since these are "neutral" foods within the hot/cold system. Other specific foods are believed to cause certain ill effects for either the mother or the nursing newborn through the mother's milk: eggs, pork, beans, lard and sometimes rice are thought to weaken or corrode the mother's blood and/or to cause her to have a bad odor, or to give the mother stomach disorders or make the infant colicky or give it tetanus. "Cold" foods, such as pork and young chicken are believed to create "cold" problems of the ovaries and uterus. Eggs, meats and fruits are sometimes believed to affect the mother's milk and give the infant diarrhea.

The mother rarely nurses on the first day after birth and often not for the first three days. During this time, the infant receives only a mixture of oil and sugar or honey and perhaps water, instead of the colostrum. Most lower-income mothers nurse their children for approximately six months; in the urban areas, this period tends to be shorter. The bulk of an infant's diet during the first year usually comes from atol (a thin gruel made with maize flour). Frequently, the atol is made with maizena

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* Annex III C contains a schematic of The Hot/Cold Food "System".

(cornstarch) rather than sorghum or maize flour. Many women believe that cow's milk is better for the infant than mother's milk. There is some tendency to believe that infants should not eat any solid foods. Eggs, meat and beans are particularly problematic foods for children under one (1) year of age, as they are thought to give infants gas and colic. Children generally eat only as often as adults.

Taken together, these types of traditional food/feeding habits among the MARP contribute to:

i) High incidence of low birthweight babies at greater risk of mortality due to inadequate maternal nutrition during pregnancy;

ii) Inadequate milk production and depletion of maternal body stores of nutrients during lactation;

iii) Poor immunological defense system and high incidence of illnesses in the infant due to non ingestion of colostrum;

iv) Inadequate supplementation of infants at the time when breast milk becomes increasingly inadequate as to quality and quantity;

v) Insufficient calories and protein intake during the first years of life.

In sum, the diet of lower-income Nicaraguans is inadequate in many respects. The constraints stemming from economic and environmental limitations on the availability of foods are exacerbated by constraints to nutrition improvement that arise from poor food habits and traditional patterns of food choice and preparation as well as the intra-family distribution and consumption of it.

2. Component Approach

A Nutrition Education Delivery System (NEDS) will be developed and supported under Component One in a comprehensive effort to improve the food habits of the target group, especially the MARP. The system will deliver information and knowledge through a variety of channeling mechanisms classified as either non-formal,

incidental (mass media) or formal. A multi-pronged approach to nutrition education has been selected for the following reasons:

i) No single delivery mechanism can reach the entire target population.

ii) Different mechanisms are capable of delivering different quantities/qualities of information.

iii) Different mechanisms can be complementary and mutually reinforcing*.

iv) Each mechanism can be designed around the motivational and educational level of the intended audience.

The NEDS will be based upon a stock of basic nutritionally related concepts and facts - developed by CTAN and outside technical advisors - each consisting of a statement of the problem being addressed, a methodological approach to solving the problem, and appropriate solution stated in behavioral terms. With this common source of nutrition content, the multi-pronged NEDS is designed to: i) provide standardized information on nutrition to all field personnel in order to avoid one from contradicting another when passing out information; ii) increase awareness of nutrition problems among the target group; iii) transmit knowledge of solutions to these problems; iv) produce changes in attitudes; and v) produce changes in practices which will improve nutritional status. Impact and benefit incidences will be carefully evaluated throughout the program period.

3. Detailed Component Description

As indicated, the NEDS will operate through three classes of channels or mechanisms. Nutritional facts and information will originate from the same basic stock of nutrition concepts (see Figure 1 below) and will be delivered by different

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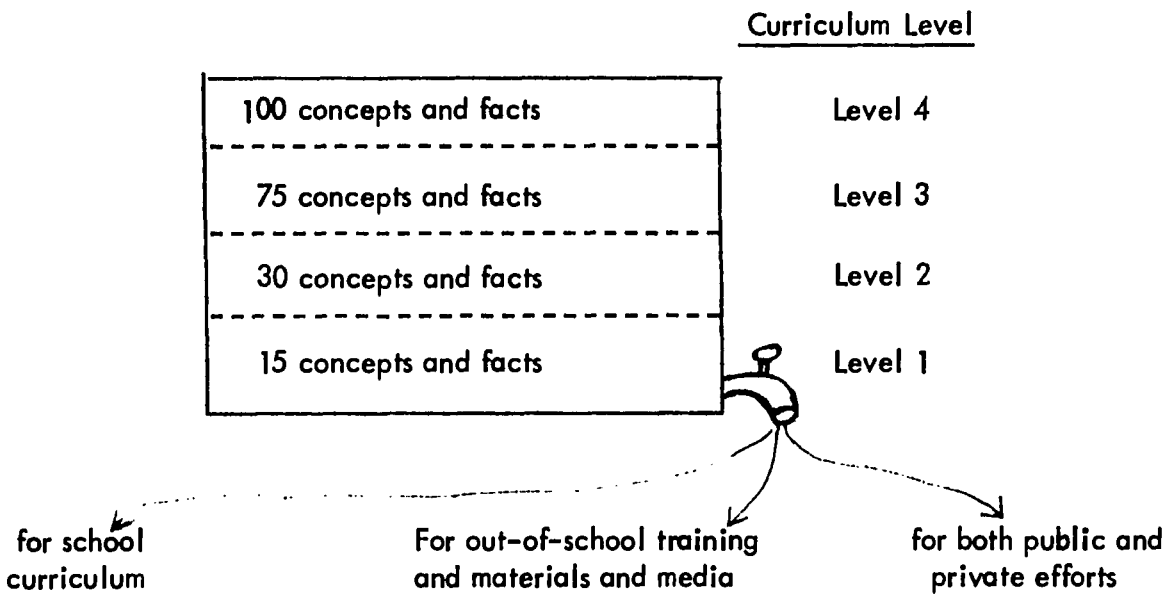
* In this regard, efforts to improve food habits should not focus upon (i.e., put the burden for change upon) only one group in the population.

mechanisms, with the manner of presentation varying to accommodate the informational needs, and nutritional and educational levels of the program's intended benficiaries.

Figure 1

Illustrative Basic Stock of Nutrition Concepts



The effort will initially focus upon those institutions already having the capacity for delivering educational services. Under the NEDS, existing personnel responsible for in-service training will receive training by CTAN. These trainers will then return to their respective institutions with the appropriate support material for training and distribution purposes, and initiate training of field personnel (beginning with those working in Region V). CTAN and outside technical advisors will be available to assist with the curricula development and the initial institutional training programs. This system ensures not only that the information provided to delivery institutions will be standardized, but also that the information disseminated by the different institutions's agents will be uniform. In addition, institutionalization of nutrition training will assure continuation, with little subsequent input from CTAN. Following initial institutional coverage, CTAN and the

MOH Division of Nutrition will provide a trainer for those agencies which do not have in-service training as well as to community people identified as potential nutrition "advice-givers" (such as religious people, store owners, etc.)

Eight different "training" and "teaching" curricula will be developed from the basic stock of nutrition concepts in coordination with the participating institutions, a long-term advisor and additional technical assistance. Each curriculum will contain the minimal 15 concepts and facts to be disseminated to the rural communities, but each will also build on this minimum knowledge to levels which correspond to the information needs and educational level of the intended audicence. Basic facts and concepts will be uniform, but the mode of presentation and amount of information will vary. As shown in Figure 1, four different levels are envisaged, with Level 1 containing the approximate minimum desirable knowledge for the target group and the general population. Based on these levels, the following eight curricula, complete with printed material and visual aids will be developed.

i) Level 1 (3 curricula). Three curricula will be developed. One, in conjunction with the pending Rural Education Development Program, will be for teaching 1st through 4th grade students for use by 1st through 4th grade teachers. The other will be for teaching organized community level education activities by means of health educators, social promoters, other public and private nutrition and health field workers, and SERN workers. The third will be for teaching pre-schoolers for use in SERNs as well as JNAPS and private sector (e.g., FUNDE) day care centers.

ii) Level 2 (2 curricula). Two curricula will be developed at level two. One, to complement the pending Rural Education Development Program's focus on grades 1-4, will be for teaching 5th and 6th grade students for use by 5th and 6th grade teachers. The other will be for training (one-week sessions) of rural health collaborators, anthropometrists, community level workers such as agricultural extension agents, SERN workers and "advice-givers" in communities such as religious people, store-owners, etc., for use by rural public health nurses and auxilliaries, health educators, and the Nutrition Division of the MOH who will be responsible for training the community workers, SERN workers and "advice-givers" in this category.

iii) Level 3 (2 curricula). Two curricula will be developed. One will be for training primary school teachers for use by the MPE trainer in close

collaboration with the pending Rural Education Development Program. The other will be for training nurses and auxilliaries, health educators, and social promoters for use by the Institute for Human Resources (MOH), PRACS, INVIERNO trainers, etc.

iv) Level 4 (1 curriculum). One curriculum for training the "trainers" in MPE, IHRH, PRACS, INVIERNO, INTA and the Nutrition Division of the MOH will be developed for use by CTAN and its technical advisors for implementation of the NEDS.

Benefit transmission mechanisms of the NEDS is shown schematically in Figure 2. CTAN's function in this activity will include assistance with, and coordination of, the curricula development and training of the in-service trainers from the participating institutions.

Because of its central importance, the basic stock of nutrition concepts and facts will be carefully researched, periodically updated and checked in support of NEDS delivery mechanisms. Development of the basic curricula is estimated to take approximately 9-12 months, and printing/distribution of relevant materials about 18-24 months initially, with updating of the information and materials on an ongoing basis.

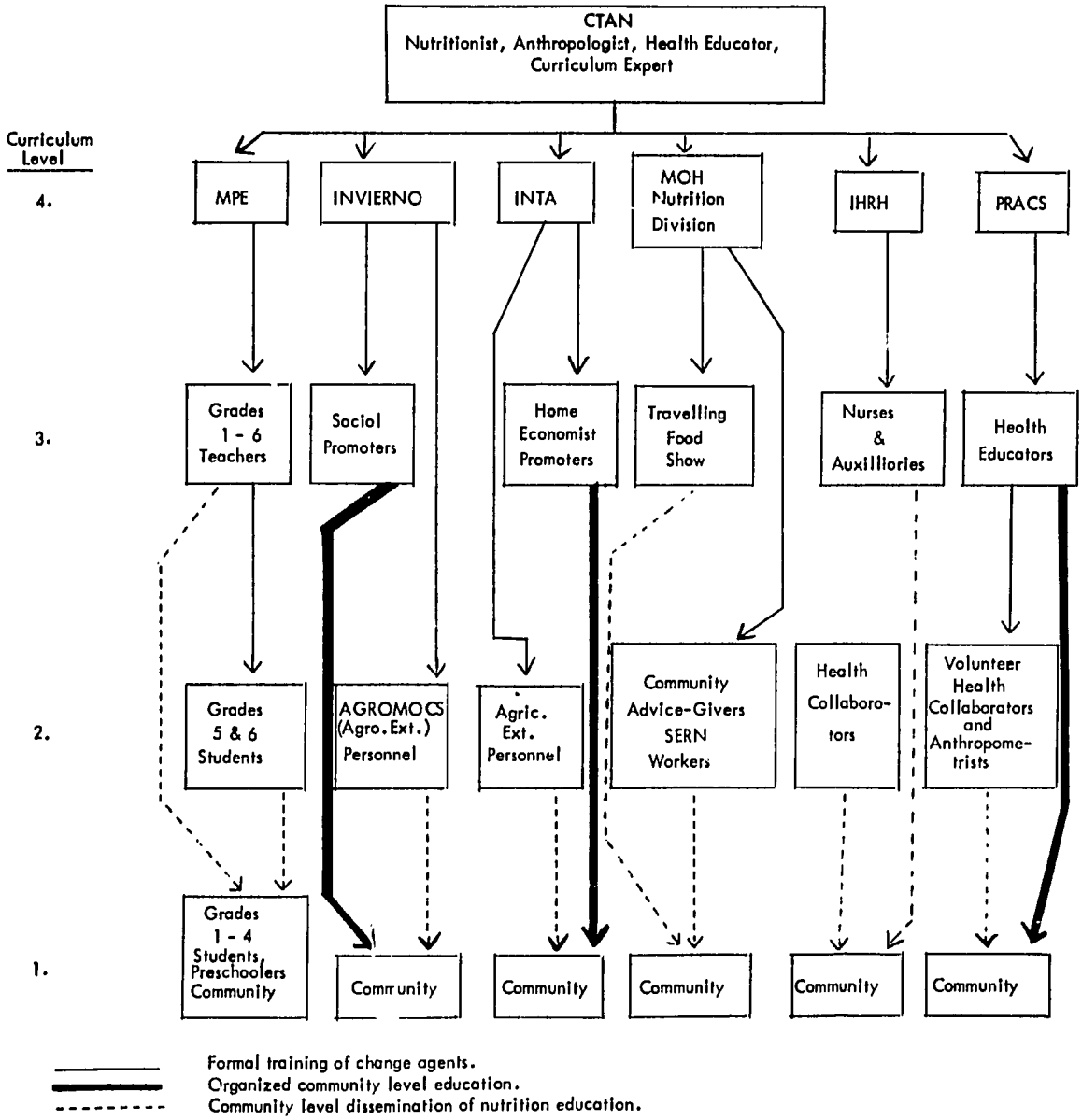
The three classes of delivery mechanisms under the NEDS are described below.

3.a Non-Formal Nutrition Education Mechanisms

3.a.1) Organized Community-Level Education. This activity is designed to take advantage of the public and private service delivery institutions already operating in small rural communities (localidades) having populations of between 150 (around 25 families) to 1000 (around 160 families). Key institutions are shown below. Under the auspices of CTAN, the major focus will be upon upgrading their nutritional knowledge and abilities to conduct organized learning sessions with visual demonstrations and a maximum of community participation.

a) PRACS. As indicated in Part II D, the PRACS arm of the MOH has shown itself to be a highly effective agent for community-level

Figure 2, NEDS Benefit Transmission Mechanisms



organization, education, and self-help action. Its approach is to enter the rural community* and, in coordination with INVIERNO, help sensitize the community to its basic problems and needs. The PRACS educator then sets about helping to organize civic-minded people into a development advocacy group or Community Development Committee (CDC) (Junta Comunitaria) for identifying the mobilizing local resources and for interfacing with the various GON agencies that are or will be delivering external services and resources through the GON's comprehensive IRD program.

In coordination with the CDC, the educator identifies a local liaison representative or rural health collaborator (CRS)**to receive basic instruction in community organization, public health activities and first aid. The collaborator will typically have limited formal education, but will be a respected, permanent member of the community and may already be somewhat involved in delivering traditional health and/or education related services to the community. The educator then motivates and assists the collaborator and the CDC in conducting a mini-diagnosis of the community's health problems and in learning about their causes and potential remedies. This is followed by CDC selection of a community health project*** and a process of health education services centering "around" that project.

PRACS educators now number 35. Each has received seven months of training in basic community organization, prventive health practices, family planning, immunizations and related topics. It is planned that another 25 will be

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* Criteria used to select participating communities include: i) INVIERNO now serving the community or planning to do so later in the program period (these are in Regions V, II and later IV); ii) community population of approximately 150 - 1000 persons; iii) willingness of community to organize itself; iv) severity of morbidity, mortality and malnutrition in the community; and v) community lack of access to services.

** Colaborador Rural de Salud.

*** To repeat, projects being supported under the Rural Health Services Loan include wells, latrines and (to come) immunizations.

trained in 1978 and 1979. The current PRACS' curriculum for health educators is quite deficient with respect to nutritional content. A solid nutrition curriculum and a set of related materials will thus be developed under Component One* so that PRACS' educators will become active deliverers of organized community-level nutrition education, including the education of collaborators, and of women through PRACS' escuelas radiofónicas.**

It is estimated that PRACS will provide nutrition education - transmission of around 15 basic concepts for nutrition improvement to some 350 communities during the program period. Assuming an average community size of 350 (around 58 families of 6 persons each), gross PRACS' coverage with first level nutrition education would be 122,500. Corresponding MARP coverage (about 29% of total) would be 35,525 under these assumptions.***

Firmly establishing the nutrition improvement know-how and capabilities of PRACS' health educators will be a key intermediate output of Component One. For PRACS will begin to play a major role in extending basic MCH services to the target groups, including the training of community level anthropometrists and other MARP-related activities. These are further described in Program Component Three.

b) INVIERNO Social Promoters. Component One will provide nutrition curricula, training and related materials to INVIERNO's Department of Social Promoters. The content will be similar, and consistent with, the PRACS curricula materials such that INVIERNO's 18 social promoters will be transmitting the same basic concepts to the target group at the community level. These

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* The PRACS training program and curricula will be institutionalized within the National Health Delivery School scheduled for opening in 1979.

** PRACS has actually found the use of cassettes and recorders to be more flexible and thus preferable to the purchase of radio time for these "Schools".

*** "What if" games (sensitivity analyses) can be played with assumptions about average community size and resulting coverage.

social promoters have demonstrated a capacity for community level impact in initiating INVIERNO's family garden project. Moreover, they will be participating in management of the Fund for Community Nutrition Projects envisioned under Program Component Two (see below). For these reasons, they are expected to play an important role in improving food habits among the target group.

c) Agriculture Extension Agents. Basic level nutrition education will also be provided to INVIERNO agromocs, INTA extension agents, Banco Nacional field personnel as well as other rural community workers in the Public Agriculture Sector. This will help reinforce the consistent, nonformal transmission of nutrition concepts through organized community-level gatherings and situations.

d) SERN Workers. Children recuperating from second or third degree malnutrition spend all day at the SERN, with very little in terms of mental or physical stimuli. Because both are considered important elements for complete recuperation of the child, Component One will provide a basic curriculum for physical and mental stimulation - using nutrition concepts - for use by SERN workers with the children. Training of the SERN workers will also be initially funded with loan funds, and will become institutionalized under the MOH Division of Nutrition. It is expected that, as proven successful, this basic curriculum will be extended to other day care centers, both public (e.g., JNAPS) and private (e.g., FUNDE), which also lack educational components. This curriculum will be simplified and derived from Level 1 of the basic stock of nutrition concepts and facts.

In addition to curative services for malnourished children in second and third degree, SERNs are also designed to provide preventive services, by means of parental education. This Component will also provide training, curriculum, and materials to be used by the SERN workers so that they might carry out this function more effectively. Although small in numbers and outreach, the advantage of the SERNs is that they serve as a collection point for extreme cases of malnutrition, thus making it easier to reach the "at risk" families with educational services.

e) Private Sector Organizations. In recognition of the importance of private sector groups (especially PVOs) at the grass roots, basic nutrition curricula and related materials will be developed and disseminated to them as well. These groups include CARITAS promoters,* CARE, CEPAD, FUNDE (both as to its cooperatives, nonformal CFER system and day care centers) as well as possible

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* Who were some of the most effective managers of the PL-480 supplementary feeding program.

others. Involving these organizations in the delivery of nutrition improvement concepts will not only provide benefits to the target group but will help assure a continuing dialogue and exchange between change agents from both public and private sectors. PVOs are known in Nicaragua for their cost-effective expertise in working with the poor, rural and urban alike.

3.a.2) "The Whaddya Know Traveling Food Show". As indicated, the nutrition education coverage to be provided by the above agents for organized community-level education will generally be at the smaller localidad level (populations 150-1000). It was determined during the program planning period that nonformal personal contact efforts to improve food habits should be pilot tested within somewhat larger population centers, including more sizeable localidades, market towns and municipalities. A mobile approach was decided upon. It will be called the "Whaddya Know Traveling Food Show."*

The "show" will consist of a mobile van that will visit target communities to put on a food and nutrition show, including entertainment centered upon nutrition themes. Entertainment is expected to include light drama, puppet shows, possibly magic, music, plus demonstration of simple recipes from locally available food resources, perhaps the distribution of vegetable seeds for planting, and baby weighing** accompanied by explanation and distribution of growth charts. The mobile team is expected to include a couple of actors and musicians, perhaps a magician and a food preparation demonstrator.

Following the initial development of themes, materials and recipes, the local contracting personnel and the purchase of a traveling van, the "show" will be pilot tested in some five to ten larger localidades in Region V. If successful in the pilot test, it will then spread throughout the larger localidades, market towns and municipalities of Regions V, II and possibly IV, depending upon its continued reception and success. While population coverage estimates are not yet possible, if the show were to reach just the 49 municipalities in Regions V and II - and attract, say, 25% of the corresponding population group - around 77,500 people would receive nutrition-based entertainment and demonstrations, leading to increased awareness of positive nutritional practices.

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* Tentatively translated as "El Que Va Cine Circulante de Alimentos." This approach has reportedly been used with success in Ghana.

** As well as head-patting.

3.b) Incidental Nutrition Education Mechanisms

These component mechanisms have the potential for reaching a large percentage of both the rural and urban population and are characterized by frequent repetitions of brief, concrete messages. It assumes that the average person has little or no interest in nutrition education and that they require motivation to learn. Three complementary and mutually reinforcing activities are planned, which will also reinforce the activities under part (a) above.

1) Radio Messages. With assistance from Manoff International, Nicaragua has pioneered in the use of short radio messages (cuñas) to promote positive health and nutrition practices among the target group. Preliminary evaluation data indicate that the method can induce measurable changes in the knowledge attitudes and practices of the people.* Seven messages have already been developed in Nicaragua.** During the program period, these and 10 - 15 more will be prepared and transmitted, all of which will be based on the same concepts and information on which all the other activities are based.

CTAN will also attempt to "piggy back" on existing radio programs by explaining its efforts to promote basic health and nutrition concepts to key radio station personnel such as station managers, novela (soap-opera) producers and producers of such popular non-music programs as "Pancho Madrigal" and by presenting them with a one-page list of the same basic nutrition concepts which comprise the cuñas and the basis for the educational campaign, with a request for voluntary incorporation of the basic nutrition concepts into the scripts of such programs. There is also the possibility of "piggy-backing" onto radio programs now being planned such as the Wisconsin Partners program in Zelaya (Atlantic Coast) and the CARE/IAN program north of the San Juan River (southeast of Nicaragua).

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* See Part II, E.2.b.ii)

** The messages deal with: i) the importance of a good diet during pregnancy; ii) the importance of giving colostrum to a newborn child; iii) how a mother can increase her milk production (through better diet and lots of liquids); iv) what a working mother can do about breastfeeding (do it before and after work); v) recipe for a nutritious "atol" (a thin gruel); vi) feed children all foods adults eat; and vii)what to feed a feverish child.

In addition, the radio will be used to encourage community members to attend the organized education sessions in their community and to make greater use of public health services from which they will receive further nutrition education information. The radio can also serve to identify which types of individuals in communities to seek out for further information on nutrition. The special attribute of the radio is its wide coverage. Beside reinforcing other mechanisms, it can reach target group people not having access to other channels of nutrition education (e.g., the disperse rural population.)

Since the radio messages will be broadcast nation-wide, their coverage is expected to reach approximately 65% of the population, i.e., nearly 1.5 million.*

2) Posters and Information Pamphlets. In order to support the nutrition education programs and the radio campaign, visual and printed materials will be produced. Small decorative posters appropriate for the wall in homes might include an attractive picture or a calendar. Posters would also be designed for service centers such as health clinics, community meeting places and schools. Store-owners and other community members who have participated in the nutrition education courses will be given appropriate identification posters to place in a highly visible place. Pamphlets written in simple language based on the basic nutrition concepts will be distributed by field promoters, health clinics, and possibly store owners for a nominal fee to facilitate dissemination of the information.

3) Advice-Giver Education. This component element is designed to take advantage of the learning experience which takes place during a brief exchange of information between someone who has a question and someone who is recognized as having answers to that question. For example, when a child has a fever, the mother will seek advice about what medicine to use from one or more sources, e.g., a relative, a pharmacist, a store-owner, etc. When the mother asks her question, she is probably more receptive to advice and new ideas than at any other time. The

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* In this regard, once radio stations planned under the pending Rural Education Program are operational, consideration will be given to the use of those facilities for the nutrition radio message activity.

key to making use of this educational channel is to identify the persons whose advice is most often sought and to ensure that they possess accurate knowledge about nutrition. While a mother or other community member may not directly seek advice about nutrition, it is possible that when she/he does seek information about other matters such as health, some nutrition advice can be dispersed as well. One of the most likely sources of advice in the campo is rural health personnel. Other key advice givers include store owners, religious personnel, injectionists, rural SNEM workers, etc.

The value of this program component is its reinforcing nature; selected community members as well as field workers will all be giving the same advice; their proximity to the people in communities may give them opportunities to influence food practices through casual conversation. If approximately two people in target communities receive some nutrition training and each, in turn, is able to pass on information to about 10% of their community, it could be estimated that sound nutrition information would continuously be passed on to about 24,500 people in 350 communities.* Brief training courses are thus anticipated for about 700 potential rural community-level advice givers in support of the non-formal and incidental nutrition education mechanisms outlined above.

3.c) Formal Nutrition Education Mechanisms

Nutrition education will be incorporated into "formal" school curricula at three levels.

1) Teacher Training Centers. With technical advisory assistance, CTAN will collaborate with the MPE and the pending Rural Education Development Program in developing a nutrition "training" curriculum for teachers of primary grades 1-6, and a "teaching" curriculum for their use in rural public schools. In addition, a person responsible for in-service training or ongoing education for those teachers already working will be trained by CTAN, in order to train rural teachers (beginning with those working in Region V) during the time when school is not in session. Food demonstrations using produce grown in school gardens (under the pending Rural Education Program and expanded under this one) will be part of the curricula.

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* Assumed average population size of 350.

2) Rural Primary Schools. This activity will be carried out in close collaboration with the pending Rural Education Development Program which intends to provide this input for grades 1-4. The reason for extending the focus to include the 5th and 6th grades is that, for purposes of changing nutrition/health behavior in rural homes, 5th and 6th grade children are a valuable resource. By age 10-12 children play an important role in infant care and food preparation and should be regarded as potential change agents for nutrition and health objectives.* Teachers trained in-service, or through the Teacher Training Centers, will have the ability to teach nutrition in rural primary schools including food demonstrations using produce grown in the school garden.

Considering there are about 510 rural teachers in Region V who will be covered either by the pending Rural Education Development Program or by this one - each covering an average of 23 students yearly - approximately 11,700 students will receive some basic nutrition education in school during the program period. Rural primary schools will thus reinforce and support the material channeled through other mechanisms.

3) National Health Delivery School (NHDS). Nutrition education will also be incorporated into the NHDS curricula, with collaboration between outside technical assistance, CTAN, and the NHDS curriculum experts. The incorporation of nutrition education into the NHDS curriculum will allow for continuous nutrition training of nurses, auxilliaries, PRACS health educators and other health service delivery agents. It will also provide for the upgrading of personnel under in-service-training.

3.d) Supervision, Evaluation and Support of the Delivery Mechanisms

1) Supervision. Supervision of Component One efforts will be the responsibility of the MOH Nutrition Division and the CTAN in collaboration with supervisors from the MPE. It is planned that four nutritionist auxilliaries will be trained by CTAN and stationed at four locations in Region V. Aside from being

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* Moreover, 10-12 year girls represent potential members of the MARP within five years or so.

responsible for some training (i.e., of community advice-givers and SERN workers), these people will also be responsible for providing support to the agencies working in rural development in that area. The regional nutritionist of the MOH Nutrition Division* will supervise the nutritionist auxilliaries.

2) Evaluation. Since knowledge that does not lead to action is of limited use in this context, the principal objective of the NEDS includes changes in both knowledge and behavior. Since each concept comprising Level 1 knowledge is associated with discrete behavior, it is expected that food habits related to the Level 1 curriculum will change in the desired direction. Setting objectives limited to Level 1 knowledge and behavior does not mean that only Level 1 knowledge will be transmitted to the target group. It does indicate that evaluation should be limited to Level 1 knowledge, partly because evaluation is expensive and should focus on the most important activities of an organization and partly because it is questionnable whether changes in Level 2 knowledge (or up) can be measured within the program period. The Nutrition Evaluation and Information System (NEIS) (See Component Four) will be used to collect data by which the NEDS can be evaluated.

3) Support. The NEDS will improve nutritional status by causing the target population to change certain food selection, preparation, feeding and consumption practices. CTAN and other agencies involved in the program have sufficient knowledge of current desired practices to design and initiate the project interventions.** However, understanding of the subject is imperfect; and there is more to be learned about food consumption patterns, food practices, taboos and attitudes in order to refine and improve the effectiveness of the program on a continual basis.

According to a recent report prepared for CTAN (Forman, 1977), the degree of variation in food practices is high, and variations are present at all levels: among individuals, communities, regions, between rural and urban settings, between

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* The Nutrition Division has five regional nutritionists stationed in Regions V, II, VI and I and in Managua.

** For example, and as mentioned, radio messages have already been designed for program implementation.

small farmers and landless laborers, and among economic sub-strata within the lower-income class. The variations are then complicated by the fact that they cross-cut, interact, and are affected by, seasonal variations in food production, availability and prices. Fuller understanding of these subjects will be important in order to effectively evaluate, refine and expand the activities being undertaken in this component. Accordingly, data about food habits will continually be sought through the delivery mechanisms, adding to knowledge in this field and permitting, through feedback to the component activities, a continuous sharpening of their focus and enhancement of their ability to impact positively on nutritional status.

Three techniques will be employed, including i) observation of food practices in selected communities using intensive, ethnographic techniques, ii) survey techniques and iii) experimental food preparation. For certain data, mechanism instruments can be developed on the basis of existing knowledge. To develop other data, small-scale, intensive research with the target group is indicated to assure the desirable feedback to component mechanisms. The complexity of infant feeding practices illustrates the need for such observational research in support of NEDS operations. Atol, a thin gruel, is generally fed to infants to supplement breast milk, but its actual content, usage and name may vary considerably by region, community, season, income level, etc.

The development of an experimental kitchen will support component mechanisms by using typical ingredients and recipes, in order to try to increase the nutritional value of commonly eaten dishes with the addition or combination of other ingredients. These new recipes (such as that for a more nutritious atol) could be disseminated to the public via the radio messages, printed materials, the "Whaddya Know Travelling Food Show," etc.

4. Inputs and Budget.

Inputs to Component I of the program will be financed by two sources, GON budgetary allocations to the different institutions involved and A.I.D. loan funds and limited grant funds. Inputs by source and the estimated budget for Component One during the program period are as follows:

a) Inputs

1) GON Inputs. These include support for salaries, material preparation and testing, support costs, radio time, material production and

distribution, transportation and vehicle maintenance costs and related operating costs. GON inputs are expected to total around $1.1 million.

2) A.I.D. Inputs. A.I.D. inputs to Component One will consist of technical assistance, material production, equipment of mobile demonstration units, other equipment, purchase of a vehicle for supervision, evaluation costs, training and related non-recurring support activities. Total A.I.D. loan inputs are estimated at $1.39 million, with an additional $175,000 in grant funds.

b) Budget. The tentative and illustrative budget for Component One - based on the supporting details of Annex III C - is shown in Table I below.

TABLE I

COMPONENT ONE BUDGET

(In U.S.$ 000)

		Source of Funds			
		A.I.D.			
Use of Funds		L	G	GON	TOTAL
i)	Technical Services	30	160		190
ii)	Materials Production	700		150	850
iii)	Commodities	140		30	170
iv)	Training	120		35	155
v)	Investigation	60	15	45	120
vi)	Operating Costs	200		840	1,040
vii)	Inflation/Contingency*	140	--	--	140
	TOTAL:	1,390	175	1,100	2,665

* Approximately 11% of loan allocation to this Component.

5. Component Timetable. Component One activities are listed in Annex III C by event and starting date. Approximately 3-1/2 years will be needed to implement these activities.

6. Outputs and End-of-Component Status

a) Outputs. The major expected outputs of Component One will be as follows:

i. Studies conducted and revealing qualitative and quantitative information on food consumption patterns, actual and potential sources of nutrients, food beliefs, taboos and attitudes, health and nutrition terminology for incoporation into the NEDS.

ii. A Master Nutrition Education Program, comprising eight (8) curricula will have been prepared and put to use.

iii. Seven (7) radio messages aired; 12 new ones designed and aired.

iv. Audio-visual and printed materials printed and distributed.

v. At least one mobile demonstration unit equipped and tested in the field; if successful, an additional one put to use.

vi. Approximately six (6) film projectors, six (6) slide projectors, six (6) overhead projectors, and 12 screens purchased and kept at central location for check-out purposes.

vii. 200 radio-cassette tape recorders, school garden kits and food demonstration kits distributed to rural schools in Region V.

viii. One experimental kitchen being used for recipe experimentation.

ix. One vehicle purchased and used for supervision.

x. Four (4) nutrition auxilliaries trained for supervision.

xi. 10 Institutional in-service trainers trained.

xii. One nutrition auxiliiary and one nutritionist trained and working in the experimental kitchen.

xiii. New nutritious recipes.

xiv. 240 MOE rural teachers in Region V trained.

xv. 22 INVIERNO and INTA social promoters trained.

xvi. 100 INVIERNO agromocs trained.

xvii. 14 INTA agricultural extension agents trained.

xviii. 600 "advice-givers" in Region V trained.

xix. 10 in-service trainers retrained.

xx. 180 "advice-givers" in Region V brought back for retraining.

xxi. Nutrition training institutionalized in at least four publically financed institutions.

b) End of Component Status. The end-of-component-status will be the institutionalization of the nutrition education and benefit transmission mechanisms described above and represented graphically in Figure 2. The mechanisms will be providing the target group with maximum, reinforcing opportunities for improving their food habits and thus their nutritional status. Changes in both will be carefully and periodically evaluated during the program period (See Component Four.)

Component Two, Increasing Food Availability

1. Constraint to Nutrition Improvement

Rural Poverty, both in terms of incomes and service availabilities,* is the cause of the most basic constraint to nutrition improvement in Nicaragua. The constraint is lack of food among the target group. It is a constraint comprised of several inter-related dimensions:

i) Lack of food in sufficient quantity, the most obvious cause of PCM.

ii) Lack of food with adequate nutritive quality which contributes to both PCM and specific deficiencies, e.g., iodine.

iii) Seasonality of food. While lack of food is a generalized condition confronting the rural poor, it is exacerbated during certain months by the cyclical nature (spot input-spot output) of agricultural production. April through July are typically months of rising basic grains prices and of increasing scarcity in the rural sector.** The relative scarcity of food during these months is a partial function of local storage and marketing facilities.

iv) Periodic crop failure. The possibility of crop failure is a normal risk and condition of agriculture. Crop failure may be due to partially avoidable events, such as plant disease or insect infestation, or it may be due to natural events over which the farmer has no control such as fire, hail, wind, flood or drought. Droughts - because they tend to be generalized and widespread - are the most disastrous of these events. They create periodic and extreme shortages of food, especially

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* Including health, education, marketing and other services.

** In terms of basic grains, the farmer's main crop (primera) is planted in May for harvest in August-September-October. A secondary planting (postrera) is made in September-October to mature in December-January, early in the dry season. Thus, the months of April through July are long of the smaller postrera harvest but short of the larger primera harvest.

basic grains, in the rural sector. Nicaragua has experienced two droughts in the past five years (1972 and 1976)*. National emergencies were declared by the GON in both years and efforts were made to relieve rural food shortage and hardship through food-for-work and other projects (supported by U.S. food donations in 1972). The limited coverage of such activities, however, was indicated by the PL-480 evaluation (see Part II B). Hardship and hunger among the rural poor in years of prolonged drought are thus especially severe.

2. Component Approach

As cutting edge of the GON's IRD program, INVIERNO is addressing rural poverty - and thus the constraint of lack of food - with its core approach to increasing rural production and incomes. Component Two of the program will complement the INVIERNO approach with a set of interventions explicitly designed to help overcome the mutli-dimensional constraint described above and thereby increase the availability of food to the rural poor. Interventions include: a) salt iodization for goiter reduction, b) the development of a low-cost, high-protein blended food, c) the design and pilot testing of community-level target group projects to increase food availability, as well as the strengthening of contingency food distribution plans to assure broader coverage during future years of drought or other widespread crop failure. These interventions are described below.

3. Detailed Component Description

a. Salt Iodization (Goiter Reduction) Project

1) Description. As indicated in the Assessment, the prevalence of endemic goiter in Nicaragua is very high. Based on findings of the 1966 INCAP nutrition status survey, it was estimated at 32% (37% for women, 25% for men). INCAP is currently analyzing preliminary data obtained from an ongoing survey to measure the regional incidence of endemic goiter in Nicaragua. The survey was conducted, at the behest of CTAN, in order to update findings of the previous survey and to serve as baseline data for a salt iodization project. It is not expected that the new data will differ significantly from the 1966 data.

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* As indicated in the USAID's Renewable Resource Program proposal, years of uncontrolled deforestation in Nicaragua's settled Pacific regions may be altering the climate and environment there, increasing its aridity and decreasing the regularity of rainfall patterns.

The GON has taken steps during the past year to address the problem. CTAN took the lead by preparing a salt iodization project to be implemented as part of the NFNP. (The full GON plan for the project is included as a Bulk Annex*). The objective of the project is to eliminate endemic goiter as a public health problem by means of i) initiating a national salt iodization program, ii) establishing an effective salt iodization control and monitoring system and iii) establishing an evaluation system to measure program impact. A Reglamento de Ley has been prepared and approved by the President of the Republic. It will put into effect the salt iodization law of 1969 and provides specific implementation instruction to the MOH for its enforcement. (See copy of Reglamento in Annex III D.)

2) Inputs. Cost of the salt iodization (goiter reduction) project will be largely financed by the GON and the producers, with de minimus first year A.I.D. loan support for laboratory and monitoring equipment. The project budget is estimated in the following table.

Table 2

Salt Iodization (Goiter Reduction) Project Budget (5 Years)

	Use of Funds	Source of Funds A.I.D.	GON/Private Sector	TOTAL
1)	Meetings with Producers (1st yr)		2,000	
2)	Iodine Pre-mix (est.$13,000 p/yr.		65,000	
3)	Equipment (9 plants at $5,000)		45,000	
4)	Training of Producers		1,000	
5)	Lab/Monitoring/Misc.Equipment	3,000		
6)	Inspector Vehicle	7,000		
7)	Inspector Salary (5 x $15,000)		75,000	
8)	Lab. Technician's Salary (5 x $5,000)		25,000	
9)	Promotional Campaign		2,000	
	TOTAL:	10,000	215,000	225,000

* The plan is entitled Yodización de la Sal Para Erradicar el Bocio Endemico en Nicaragua.

3) Outputs. The basic output of the project will be iodized salt and the promotion of its availability to the target group. INCAP has estimated that the average daily per capita consumption of salt in Nicaragua is between 12 and 16 grams and, in warmer regions, between 17 and 22 grams. It is assumed that consumption of iodized salt in these quantities suffices to eliminate the risk of endemic goiter.

4) End of Project Status. The expected EOPS after five years is that virtually all Nicaraguans will be consuming iodized salt and that the incidence of goiter will be approaching zero.* CTAN has a tentative midway target of 10% incidence after the first three years of the program period.

b. Development of a Low-Cost Blended Food

1) Antecedents. As envisaged in the Nutrition Program Development Grant Paper, a decision would be reached regarding the development and production of a low-cost, high protein blended food using locally produced or available food crops to address the problem of inadequate protein consumption**. A positive decision has been taken. The CTAN, in collaboration with DIT and INTA*** and assisted by INCAP, will conduct a carefully designed research and development (R&D) effort to test the feasibility and impact of such a food among the target group.

The fruit of the jicaro**** tree has been initially and tentatively selected as the best potential source of the blended food for the following reasons:

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* INCAP's evaluation of Guatemala's salt iodization project showed a decrease of from around 20% to 4-5% after a five year period.

** INCAP survey (1973) revealed 15% of population consumes less than 75% of protein RDA.

*** DIT is the Central Bank's Technological Investigation Division. (It operates a food research laboratory). INTA is the new technical and research arm of the Ministry of Agriculture.

**** Jicaro (Crescentia alata) is a small tree - 4 to 8 meters tall - which thrives on heavy, poorly drained soils (often sonsoquite soils) in flat valleys on the Pacific slope of Central America. It produces an abundance of softball-or-larger size fruits along its trunk and larger branches. The smooth-skinned shell of the fruit is filled with a reticulated pulp in which are embedded hundreds of heart-shaped seeds.

a) Numerous prefeasibility studies, investigations, laboratory analyses by INCAP, INTA and others* that have: (i) identified jicaro as a largely untapped Central American natural food resource with high potential; (ii) established the highly nutritious quality of jicaro seed (25-30% protein on a dry weight basis, with 80% digestibility; 30% soybean quality oil); and (iii) proposed technologies and strategies for its production and distribution.

b) Jicaro already has some commercial importance and acceptance in Nicaragua. The seeds have a pleasant flavor, particularly when toasted. They may be eaten as is, or they may be mixed, as is more common, with rice and cinnamon and ground to a powder (orchata) which is combined with water or milk to make a pleasant, nutritious and refreshing beverage. Recently, jicaro orchata powder has been produced and marketed as a convenience food and attained ready acceptance.

While the blended food may well be based upon another source or sources - such as soya or wing-beans - these factors (further detailed in Annex III D) support an initial R&D focus upon the jicaro fruit. In this regard, it is noted that INCAP is one of the most positive promoters of such an R&D effort** to produce a possible successor to Incaparina as a nutrition supplement, and one with more widespread acceptability. The R&D project described below represents a serious effort through economic and technical feasibility analyses and pilot-scale production, product testing and distribution to determine conclusively the potential of a low-cost belended food as an important source of nutrients for the target group.

2) Description

a) Analysis of Availability and Costs of Supply. Information on the economics of jicaro production and processing is limited and based on traditional home industry practices. Those practices effectively limit the suppiy of

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* See Annex III D for list of works.

** See list of works in Annex III D, especially those by R. Gomez Brenes and Carlos V. Tejada (Director) of INCAP.

clean seed in the market. Relief of this constraint by central processing will alter the economic relationship, as would a significant expansion of the market which is expected to occur under aggressive promotion, lowered prices and distribution.

This analysis will establish realistic parameters for prices of jicaro delivered to a plant, prices of other raw materials and of costs of plant operations. These data will be used to compare jicaro product costs with costs of comparable processes using other high protein sources. An important component of the study will be a thorough analysis of the supply of jicaro seed. A reconnaissance survey will be made of the geographic distribution of stands of different densities, of accessibility, and production seasonality. The study would include storability of the fruit and seed, current seasonal volumes and prices of the seed and an assessment of the potential for, and consequences of, increasing output. Special attention will be given to the potential for production by the small farm sector.

b) Pilot Plant Development. This activity will: (i) identify appropriate location, technical management and operators of pilot plant,* (ii) design rations and test nutrient value and digestibility of each product** after processing to determine effects of water maceration, milling, roasting and extrusion; (iii) determine the potential for production of marketable by-products (e.g. possibly the pulp for animal feed, the shells for decorative or other purposes); (iv) define operating rations and volumes required to complete the pilot plant design; (v) design, manufacture and test specialized processing equipment; (vi) identify and obtain the complementary standard equipment necessary; (vii) install and initiate pilot plant operations. See Annex III D for graphic display of plant design options proposed to CTAN by R. Brenes of INCAP, 1977.

c) Production, Testing and Distribution. Approximately four products will be produced and tested*** among a large and varied enough

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* The plant may initially be located at INTA.

** As is indicated below, it is anticipated that around four products will be produced and tested.

*** Beside the beverage, experimentation with bun or cookie products may be conducted as may experimentation with bread or corn oil fortification.

sample of children to obtain an adequate response on acceptance and impacts. After initial small-scale tests, they will be distributed on a larger scale to selected sites in Regions V and II for sale - through community stores (including INCEI agencies, INVIERNO tiendas) at possible subsidized prices - and for use as supplemental foods for malnourished children through the health centers and community health/nutrition agents. It is expected that smaller quantities will also be administered in controlled tests to malnourished children in JNAPS hospital wards and in semi-controlled tests to children in the SERNS (MOH recuperation centers). Products will be carefully evaluated in terms of acceptance, impact, storage and distribution factors. Bulk form marketing will be conducted with an eye to cost and price minimization.

d) Evaluation. An overall evaluation of the project will be carried out to determine whether to proceed with a complete feasibility study upon which to base full-scale national level production and distribution. Assuming positive conclusions from the evaluation, terms of reference for a detailed feasibility study would be prepared including (i) analyses of agronomic and ecological factors involved in future large scale cultivation of jicaro or other crop, (ii) economic and technical analyses of large-scale collection, processing, production, distribution and nutritional factors as well as (iii) management and organization factors.*

3) Inputs. This pilot project will be organized and directed by CTAN in close collaboration with the Central Bank's DIT, the MOA's INTA, INFONAC and the Banco Nacional, assisted by INCAP and A.I.D.

Step one - analysis of availability and costs of supply - will be conducted by the GON with approximately two person months of technical assistance provided by A.I.D. in the form of an agriculturist and food industry specialist. Step two, pilot plant development, will involve: all GON participating institutions; INCAP which has tentatively committed itself to provide four to five months of technical assistance on nutrition questions; and A.I.D. which will provide technical assistance and pilot plant equipment financing**. Step three - production, testing and

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* If full-scale feasibility is concluded, a mixed public-rivate enterprise ("empresa mixta") may be the most desirable organizational format with a view to both social and efficiency requirements.

** This will likely involve the development of simple prototype equipment. While consideration will be given to the possibility of community level equipment, it is expected that efficiency considerations will argue for a centralized pilot plant, probably located at the DIT's food research laboratory.

distribution - will also involve most of the GON agencies mentioned above, plus the MOH in product distribution to the target communities, INCAP in impact evaluation, and A.I.D. through some operating costs of the production and distribution. Step four, evaluation, will involve most of the Nicaraguan participants, INCAP and A.I.D. Step five, feasibility study design, will also derive inputs from most of the same participants, coordinated by CTAN. The tentative and illustrative allocation of funds to the project is shown in Table 3.

Table 3

Budget Summary
(in US$000)

Uses of Funds	Sources of Funds A.I.D.	GON*	INCAP	TOTAL
Technical Assistance	50	50	25	125
Equipment	100	5		105
Production/Testing/Distribution	75	70		145
TOTAL:	225	125	25	375

The allocation of A.I.D. financing to the four-phased project is envisioned in Table 4 below.

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* These estimated GON inputs are exclusive of CTAN inputs which, although crucial to the R&D effort, are accounted for under Component Four.

Table 4

Budget Matrix - A.I.D. Funds

Phase		T.A.	Equip.	Operating Costs	TOTAL
i)	Analysis	10	-	5	15
ii)	Pilot Plant Development	20	100	5	125
iii)	Production, Testing, Distribution	10	-	65	75
iv)	Evaluation	10	-	-	10
	TOTAL:	50	100	75	225

4) Outputs. This activity is designed to produce a number of outputs which, taken together, will increase the availability of a specific nutritious food for the target population, if expansion of the project to a national scale is determined to be feasible. If not, the GON will have gained considerable knowledge of the feasibility and alternative solutions for increasing target group consumption of nutritious foods, and will be better able to pursue that objective.*

The R&D output from this project will be a determination as to whether a blended food product based on jicaro (or other crop) is a viable source of supplementary protein and calories useful to significantly improve the nutritional status of children under five years of age and pregnant and lactating women. An expected, combination production-impact output will be approximately 250,00 lbs. of high protein blended food consumed by a large sample of the target population of 0 - 5 year children (assuming the product is field tested.)

5) End of Project Status. By the end of the project, the GON will have made a decision, based on solid evidence, whether to expand the production and distribution of a blended food to a national scale.

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* See Annex IV B regarding the role of government in sponsoring socially-oriented R&D and the associated need for an R&D mentality.

6) Project Timetable

Event	Dates
Analyses of Availability/Costs	January 78 - June 78
Pilot Plant Development	March 78 - December 78
Production, Testing, Distribution	January 79 - September 79
Evaluation and Feasibility Terms of Reference	October 79 - January 80

c. Pilot Projects for Food Availability. During the program development period, numerous project activities were identified as worthy of further investigation, development and pilot testing with a view to increasing the availability of food and nutrients to the target group. Funds will thus be provided for a two phase - design and execution - effort to deliver food availability projects.

1) Description.

a) Phase One, Research and Development of Pilot Projects. Limited grant and loan funds will be available to finance the expertise and resources needed for pilot project development and, as required, preliminary testing. The following types of illustrative projects are tentatively envisaged during the first two years of the program period (1978 and 1979).

(1) Community Stores and Granaries. As mentioned in Part II D, INVIERNO has planned the testing and development of a series of tiendas campesinas at its cede or cabecera municipal level (population ranges normally above 1500).* The tiendas would be cooperatively run to provide both agricultural inputs as well as basic grains for consumption and would serve surrounding localidades. At the same time, INCEI is planning to extend its system of agencias.**

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* For example, INVIERNO is considering tiendas in San Ramón (pop. 1,850), La Trinidad (pop. 4,150), Condega (pop. 3,910), etc., (all of which are surrounded by smaller population centers or localidades). INCEI agencias are typically located in similar or larger population centers.

** As mentioned in Part II D, agencias are supplied by INCEI - but are privately owned and operated - "poor man's stores" that sell mostly basic grains in bulk form.

Both activities will serve to increase the number of retail food outlets and storage facilities in target areas of the rural sector. But many smaller target communities may be beyond the reach of INVIERNO tiendas, INCEI agencias (or other outlets and storage facilities) and thus be (i) susceptible to wide seasonal swings in prices that effectively lower the availability of food as well as (ii) extremely vulnerable to food scarcities during drought.

A pilot effort has thus been selected to test the feasibility of developing village-level stores or granaries. The project would include: i) survey of target - INVIERNO, PRACS/PLANSAR - localidades to assess the need for such facilities as well as community interest; and ii) the design of simple plans for both the construction with, and management of such facilities by, community resources.

(a) Inputs.* Technical services costing around $10,000 (e.g. 2 x $5,000 per month) are estimated for the survey and design work. A.I.D.-financed advisors would work with and be supported by CTAN and PLANSAR officials in coordination with INVIERNO, INCEI as well as community level officials. Host country inputs would be estimated at $5,000 in support costs (exclusive of CTAN inputs).

(b) Outputs and EOPS. The outputs would be i) completion of the survey of target communities; ii) determination of feasibility; and iii) if feasible, completion of project design. The anticipated and hoped-for EOPS would be a ready-to-go community-level project that might be supported during phase two of this component element.

(2) Food Fortification Projects. As indicated above in the section on Development of a Low-Cost Blended Food, there is a lack of food technologies in Nicaragua that focus upon the fortification and upgrading of foods typically consumed by the target population. Investigation is necessary to determine what food

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* One pre-input is available. It is a preliminary review of the feasibility of Community Granaries included in A Strategy for Nutritional Interventions in the Small Farm Sector. In addition, outputs of the Food Distribution Study will be available at the end of CY 1977.

products could be fortified most feasibly in terms of i) costs, ii) potential nutritional benefits, iii) the economic/legal environment, etc. A pilot effort has been designed to this end.

(a) Inputs. Approximately three person months of services from a food technologiest are estimated for the survey and R & D work ($15,000). This individual would be familiar with successful fortification schemes in other L.A. countries and work in collaboration with a CTAN nutritionist, the Central Bank's DIT unit and the Ministry of Econo.y, Industry and Commerce (MEIC)* in the determination of viable options for implementing one or more food fortification activities. Special attention would be directed to the fortification of foods consumed by the MARP.** GON personnel, supporting and immediate follow-up costs would be estimated at $10,000 (exclusive of CTAN inputs).

(b) Outputs and EOPS. If one or more fortification schemes were found to be feasible, the output would be preliminary design and costing of it (them), along with the description of programmatic steps remaining to be taken to achieve fortification (probably by the private sector with MEIC support and promotion).

(3) Patio Crops Project. As expressed in Part II D, INVIERNO has started a family garden project. Moreover, school garden activities are contemplated under the pending rural education program. INVIERNO efforts are currently directed to the production of annual vegetable crops for both sale and home consumption. Neither the Institute nor other rural agencies (e.g., Banco Nacional, INTA) have yet focussed upon the significant nutritional (and deferred income) benefits to be derived by generating perennial food from "patio crops".

Patio crops include fruit trees (e.g., mangos, citrus, papaya, banana, etc.) as well as perennial vegetable crops (e.g., mung beans, asparagus, etc.) that could be grown in limited numbers around homesteads in the target

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* The MEIC has a Division of Small Food Industries.

** One possibility to be explored is fortification of bolis (essentially popsicles) that are very popular among the pre-schoolers (as well as schoolers) both in and outside of Managua. Pregnant and nursing women are also known to enjoy them.

communities, primarily for home consumption. These plants begin to bear in one to four years and provide a continuing and diversified source of preferred foods for the family. Compared with farmstead animals, patio crops require similarly frequent but more limited care* by the family. Further investigation is needed to determine i) community and target group interest, ii) possible sources of inputs (e.g., tree seedlings), iii) possible cooperative arrangements as well as other related factors. A pilot survey and design project is thus envisioned.

(a) Inputs. Approximately $10,000 would be required to finance community-level survey work and to design best-practice agronomic techniques for the pilot testing of patio crops including some actual demonstration efforts, purchase of seedlings, etc. The A.I.D.-financed advisor would work with representatives from CTAN, INVIERNO and INTA in conducting this pilot activity. Their personnel and supporting inputs would approximate $5,000 (exclusive of CTAN inputs).

(b) Outputs and EOPS. If survey, design and testing work indicate feasibility, the EOPS would be the demonstration of patio crop culture. It is hoped that this R & D activity would produce a "ready to go" community-level project that might be supported during phase two of this component element.

(4) Food Cooperative Study and Design. As indicated, seasonal fluctuations in the availability and price of food, - coupled with the time/money spent in transportation to and from markets in obtaining food from wholesale/retail sources - effectively act to lessen the availability of food to the target group, not only in small rural villages but in municipal and peri-urban population centers as well. The promotion and development of food cooperatives represents one approach to such constraints. A pilot study and design effort has thus been developed.

(a) Inputs. The CTAN, in cooperation with the Special Projects Division of the Central Bank and the Banco de Credito Popular, will utilize the services of a food cooperative advisor who is knowledgeable

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* And even more limited effort in comparison with the cultivation of annual garden crops.

about experience with food cooperatives in Latin America. The advisor will i) help evaluate prior and current food cooperative experience in Nicaragua and ii) help determine the feasibility and costs (physical and technical inputs) of a food cooperative that include transportation to obtain food for sale within the cooperative. Possible sites will also be determined.* An estimated $15,000 would be required for the advisor and related services (e.g., 3 p.m. of U. S. advisor at $5,000 each). GON supporting costs (exclusive of CTAN) would be around $10,000.

(b) Outputs and EOPS. It is expected that the study will produce a design for at least one food cooperative, including proposed credit arrangements with a local lending institution to finance start-up costs and continuing working capital requirements if necessary. In addition, this pilot effort will provide CTAN with the data needed to publish a booklet on "Steps to Setting up a Food Cooperative" that would then be made available for general distribution to target group communities.

(5) Other Pilot Projects. In addition to the pilot project studies for food availability envisaged above, it is contemplated that others will be conducted as well. Potential examples that have been discussed include R & D of small animal raising projects** (CTAN-INVIERNO-INTA), design of a rural aqua-culture project (CTAN-INTA) as well as possible others. Approximately $25,000 of grant funding would be available to provide the expertise and resources needed for such additional efforts (e.g., up to 5 p.m. U.S. services at $5,000 each). GON inputs (exclusive of CTAN) would be estimated at $15,000 including personnel, support and immediate follow-up costs.

The administrative requirement in each case - as with the four pilot efforts envisaged above - is that CTAN work and plan together with at least one operating agency having interest in executing the project, should results of the investigation prove feasible. To repeat, the major selection criterion for all pilot projects is that the project have true potential for increasing the availability of food and nutrients to the target group at reasonable costs.

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* In this regard, possible sites would be expected to be in rural municipalities or peri-urban centers.

** For example, homestead raising of rabbits, goats, chickens, etc. Beekeeping would be ruled out as CARE is developing a 1978 "apiculture" project with INTA.

b) Phase Two, Execution of Pilot Projects for Food Availability. Phase One R & D efforts during the first two years of the program period are expected to result in fully designed "ready-to-go" projects for implementation at the community level. Loan funds will thus be available to support the implementation of such projects on a self-help basis. Loan funds will also be available for irrigation support of INVIERNO's family garden activity and the school garden activity planned under the pending rural education program.

(1) Fund for Community Nutrition Projects. It is planned that a fund for community nutrition projects will be established, probably on a revolving basis. Although decision as to location of the fund will partially depend upon the design outputs of phase one, it is expected that PLANSAR and/or INVIERNO will administer the fund (INVIERNO perhaps through its Social Promotion Division*). The fund will assist communities and rural families in carrying out small-scale food projects such as community stores and granaries, patio crops, small animal raising projects as well as others. Maximum community and family self-help will be emphasized. A set of procedures for administering the fund** will be required as a condition precedent to disbursement for it.

(a) Inputs. An estimated $125,000 of loan funds will help finance the type of community-level food projects specified above. GON inputs will be provided through PLANSAR and/or INVIERNO social promoters in the approximate amount of $40,000.*** It is estimated that community in-kind contributions (labor, materials, etc.) will be not less than 20 percent of credit costs or $25,000. Total inputs would thus be estimated at $190,000.

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* Currently consisting of 18 promoters trained in community organization, home economics, etc., these promoters are active in the family garden project and are motivated toward the development and implementation of additional village level projects as well.

** It is expected that CTAN, PLANSAR and/or INVIERNO will jointly develop the procedures. Once they are developed, social promoters or other community-level workers will then assist communities in the preparation and implementation of eligible projects.

*** For example, 10 promoters working one quarter time on such projects for two years at an average annual salary of $6,000. That is, 10 x 25 x 6,000 x 2 = $30,000 to which is added 33-1/3% in support costs of $10,000 for a total of $40,000.

(b) Outputs and EOPS. The outputs will be food projects* supported by limited external financing, community-level promoters and maximum self-help by the beneficiaries. If proven successful on this demonstration scale, the expected EOPS will be the replication of these (some or all) food project activities to the rural poor in other target communities and a corresponding spread of the nutritional benefit associated with increased food availability.

(2) Water Support for Community Garden Projects. As indicated in Part II D, PLANSAR has started strongly in its rural potable water and latrinification program under the Rural Health Services Loan. At the same time, INVIERNO has initiated its family garden project and school garden activities are planned under the pending rural education program. Simple irrigation lines and materials are necessary to maximize the chances for demonstrating success with these self-help food-increasing activities.

(a) Inputs. To assure the necessary water and related support, approximately $90,000 from the loan will be available to finance pipe and related inputs needed to extend water lines from the wells being installed by PLANSAR to (or nearer to) the sites of family gardens or the schools.** Depending upon actual requirements for line extension and community design, these inputs could support garden projects in up to about 66 demonstration communities. (That is, if average line requirements were 200 meters, some 150 or so communities could be served; if 300 meters, then some 90 or so communities could be served.) Actual line extension needs will be determined by the communities with assistance expected from PLANSAR engineers and INVIERNO social promoters. Varying with the number of communities to be served, PLANSAR supporting inputs associated with these water lines would likely approximate 33-1/3% ($30,000.) Community inputs would be estimated at 25% ($22,500), the major element of which would be trenching for and laying down the lines.

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* If the maximum size project from the fund were set at $1,000., there would be at least 150 such project outputs in target communities. If the average size operation were $500., there would be some 300 project outputs.

** As established in FAR procedures under the Rural Health Loan, 2" to 1" diameter PVC distribution pipe costs about $3.00 per meter. If the full $90,000 were utilized for just pipe, some 30,000 meters could be financed at current prices including appurtenances such as hosebibs, T pipes, etc.

(b) Outputs and EOPS. The basic outputs of this support activity would be simple irrigation schemes for family and school gardens in an estimated 90-150 communities (again depending on average line extension requirements). The successful demonstration of watered, productive gardens would produce an EOPS wherein the irrigation support activity is accepted by all parties and being extended to additional numbers of communities.

Table 5

Budget for Pilot Projects

(in US$000)

		Source of Funds		
		A.I.D.	GON/Communities	TOTAL
a)	Phase I R & D	75	45	120
b)	Phase 2			
	i) Fund	125	65	190
	ii) Water Lines	90	52	142
	TOTAL:	290	162	452

d. Emergency Food Shortage Project Design. As indicated above, the rural poor are at most extreme nutritional risk during periods of prolonged drought, crop failure and resulting food scarcity. The GON's procedure for responding to such occurrences* is for the Office of the Presidency to declare a national emergency and to instruct INCEI to move basic grain supplies from central silos to regional silos** in

* Again, there have been two droughts in the past five years. Flooding and crop washout has been more of a problem in Zelaya on the Atlantic side.

** See map of Annex III A for sites of major INCEI silo and storage facilities.

the drought areas and from there into surrounding agencias to provide for local food-for-work and other relief type projects.* The problem has been limited coverage of drought victims by these efforts, as indicated in Part II B.

For this reason, high priority has been assigned to assisting INCEI develop improved plans for responding to national food emergencies.** Up to five person-months of expert technical services - in the areas of food emergency planning, food distribution and perhaps food-for-work programming - are thus envisaged to help INCEI develop an improved "Plan Sequía" that will provide wider coverage and relief of drought (or flood) - related hardship and hunger among the rural poor. While the scope-of-work for these services remains to be jointly developed by CTAN and INCEI, in coordination with the Office of the Presidency, it is expected to cover (i) a review of existing emergency plans, (ii) the management of buffer stocks, (iii) means of extending the distribution network (e.g., to INVIERNO tiendas or, possibly in the medium term, to community stores or granaries), (iv) locational criteria for the planned extension of INCEI's system of agencias and so forth. Outputs from the National Food Distribution Study, scheduled for completion in late 1977, would represent a "pre-input" to this effort.

1) Inputs. A.I.D. inputs would approximate $25,000 for the above-described services. INCEI personnel, support and other inputs would be estimated at $15,000. This study and design effort would be carried out within a 12 to 18 months period.

2) Outputs and EOPS. The main output of this activity will be the development of feasible recommendations for improving the structure and capability of the GON to respond to national or regional food emergencies. The hoped-for EOPS will be GON acceptance of the recommendations and its initiation of steps to implement them.

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* USAID representatives recently visited several of these regional silos and agencias in Region V. It was interesting to learn that, during the 1976 drought - in areas where food-for-work projects were not available to the resident rural poor - INCEI actually donated basic grains to especially hard-hit communities, thus helping them to ameliorate extreme hunger and hardship.

** In this regard, it is deemed probable that a drought or flood - related emergency food shortage will occur during the period of the five year NFNP, meaning that this effort will likely impact upon the target group during the program period.

4. Component Budget. Aggregating inputs from the above four elements of this component, the tentative and illustrative budget is as follows.

Table 6

Source of Funds

(in US$000)

		A.I.D. L	A.I.D. G	GON*/Private Sector**	TOTAL
a)	Salt Iodization	10		215	225
b)	Low Cost Blended Food	200	25	150	375
c)	Pilot Food Projects	240	50	162	452
d)	Emergency Food Plan		25	15	40
e)	Inflation-Contingency***	50	--	--	
	TOTAL:	500	100	542	1,092

Grant funds ($100,000) will be allocated to this component in accordance with the criteria set forth in Part I E.

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* GON inputs herein are exclusive of CTAN.

** Private sector includes a) salt producers, b) INCAP, and c) rural communities respectively.

*** Eleven percent of loan allocation.

5. Component Timetable

a. Salt Iodization. A.I.D. financed laboratory/monitoring equipment will be acquired during 1978, the first year of program operations. GON and private sector inputs will be made throughout the five (5) year NFNP (1978-1982) in accordance with the reglamento and plan to be required as a CP to Disbursement. (See Part V E).

b. Development of a Low-Cost Blended Food. The preliminary timetable for execution of this R & D project is shown above under 3 b 6). It will be firmed up in CP documentation (again, see Part V E).

c. Pilot Projects for Food Availability. Phase one (R&D) of this component element will be conducted during the first two years of the program period (1978-1979). It is expected that the Fund for Community Nutrition Projects will commence operations in 1979 and continue through 1980-1981. The PLANSAR water support activity, however, will start up as soon as the scale of family and school garden activities begin to demand it, e.g. beginning in latter 1978.

d. Emergency Food Shortage Project Design. Twelve to 18 months.

Component Three, Extending MCH Services

1. Constraint to Nutrition Improvement

The MOH has a small maternal and child health (MCH) staff at the central level and limited operating funds. The MOH's 130 health centers offer services for women which include family planning, prenatal, parturition and post-natal care as well as immunizations (tetanus), health education, limited home visitation and, when available, vitamins and iron tablet supplementation. Well-child clinics concentrate on growth and development of the child (anthropometric measurements), immunization, health education, and distribution of vitamins/iron tablets or other drugs when available. The coverage of this system is limited. It currently extends to an estimated 23% of pregnant women but of that number only 33% are seen before the 5th month of pregnancy. The coverage for the 0 - 1 age group in the rural area is approximately 15% and 5% for 1-5 year olds . The limited MCH coverage of the MARP is a major constraint to nutrition improvement. It is reflected in the high rates of morbidity and mortality that plague the MARP. For instance the maternal mortality rate in 1974 was estimated at 280+ per 100,000 live births and the infant mortality at 120+ per 1,000 live births when correction for the under-reporting of rural areas is included*.

The strategy of Component Three is to extend basic MCH and nutrition-related services to the target group through the establishment of linkages between the formal health system (e.g., health centers) and the extended system of rural health care educators and collaborators - being developed and supported under the Rural Health Services Loan Program. Component Three adds logical, nutrition impact interventions to the direct action efforts - health education, environmental sanitation, first aid and immunizations - now being conducted under that Health Program.

The concern is with decreased physiological capacity in individuals to grow and maintain nutritional status. This reduced capacity is directly associated with the incidence of gastro-enteritis, anemia, other vitamin deficiencies and protein calorie malnutrition or any combination of the above. Without appropriate and timely

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* See additional data about limited MCH coverage in Chapter 5 of the Health Sector Assessment.

interventions, these debilitating nutrition-related problems will cause the MARP to suffer serious and long-term sequelae. Using an epidemiological approach, this Component focuses on the incidence, spread, duration and control of those diseases and/or deficiencies which directly impair the human body's ability to grow, to learn, to work and to produce and nurture healthy offspring. It thereby supports and complements the efforts to be conducted under Components One and Two of the program. Better food practices and increased food availability will be more effective in improving nutritional status if the target group is able to adequately absorb and utilize nutrients. By enhancing the physiological status of the target group, Component Three's interventions will help assure greater benefits from concurrent direct nutrition improvement efforts, especially for the MARP.

2. Detailed Component Description

This Component is comprised of three elements which will be executed by the MOH through PRACS/PLANSAR and the MCH/FP Division in technical cooperation with CTAN and the MOH Division of Nutrition. These elements are described in the Sections that follow.

a. Rural Community Nutrition Surveillance

1) Approach. This element will establish procedures for the weighing of children at the community level to i) identify those who require special nutritional attention, ii) provide ongoing screening for individual care and iii) obtain anthropometric data for the Nutrition Evaluation and Information System (NEIS) to be established under Component Four.

The problem of PCM and its interaction with infection is the most severe pediatric problem in Nicaragua. (See Annex III E for Leading Causes of M-M in the 0-5 Population.) A large number of these childhood diseases would not lead to death or severe morbidity if they were not aggravated by malnutrition. Therefore the assessment of the nutritional status of children is significant. Assessment can be based on either anthropometric indices or clinical signs of PCM. A clinical appraisal is expensive and gives an incomplete account of the extent and severity of the problem within a population group. On the other hand, community-based anthropometric procedures and indices are relatively inexpensive and represent a useful preventive tool

for improving the health and nutrition of young children. This component element will install the use of scales in rural communities to weigh children for the following purposes: i) to demonstrate levels of malnutrition and to motivate preventive and curative intervention on the part of the family; ii) to maintain a growth chart assessing progress over time; iii) to screen for high risk cases; iv) to educate the family about the growth of child; v) to evaluate the effect of applied nutrition programs; and vi) to appraise the trends in the nutritional status of populations undergoing socio-economic changes.

The methodology for teaching the use of Gomez growth charts for assessing progress of children and teaching parents will be incorporated into the curricula of the PRACS basic education programs which include training of health educators and rural health collaborators. The health educators will receive in-service nutrition education and thereafter will be responsible for:

i) training community weighers or anthropometrists to weigh children and record the results on the individual child's growth chart;

ii) distribution of scales, Gomez growth charts and tape recorder-radios to those anthropometrists who successfully complete a one-week training program;

iii) technical supervision of the anthropometrists;

iv) in-service education of rural health collaborators and anthropometrists in nutrition education.

The community committee (Junta Comunitaria) will be responsible to designate a community member, well known, trusted and centrally located who is willing to volunteer time as an anthropometrist and to volunteer his/her home to house scales, growth charts and other educational materials. The volunteer anthropometrists will be trained in groups of no more than ten in the use of growth charts and tape-recorder-radios during a one week training program. The education in the use of growth charts will be in large measure by practice, that is by using the charts to weigh children and practicing the techniques of recording, interpreting and communicating results. Teaching motivation skills to elicit the involvement and participation by the parents will be a vital part of the training. Education in the use of

growth charts will need continual reviewing, reappraisal and renewal. Cassettes will relay nutrition information and the radios will be used to receive nutrition messages to be transmitted by radiophonic school and other radio-supported primary education.

Whether the growth assessment or "surveillance" can be successfully combined with a nutrition education program is by and large dependent on the morale and training of the community's volunteer anthropometrist. At the end of the initial training session, the anthropometrist will receive the scales for community use, a supply of Gomez charts sufficient to cover the 0-5 year population of his/her community and a tape recorder with tapes sounding nutrition messages. He/she will be instructed to refer Class II and III malnourished children to the collaborator or the nearest health center. (See Annex III E for a pictorial view of the means to identify such children on the Gomez growth chart.) The records of the anthropometrist will serve as an index of the prevalence of malnutrition in the community and will aid the health educator in the determination of priority areas for health/nutrition education.

2) Phasing. Implementation of the rural community nutrition surveillance activity will be sequentially phased. Six inter-related phases are foreseen.

a) Phase One. The PRACS program instructors will revise their teaching manuals (curricula) for health educators to include teaching of the use of scales, Gomez growth charts, tape-recorder-radios, as well as the methodology for transferring this information to a community volunteer who may have little or no formal education. Also to be developed are the methodologies for transfer of nutrition information via the health educator to the community, to the rural health collaborators and to the anthropometrists. As described above, technical assistance to develop these curricula and methodologies will be financed under Component One of the program.

Communities will be selected (approximately 120 per year) in conjunction with the spread of PLANSAR activities. These communities will, by their selection, have already demonstrated willingness to be involved in self-help activities. Community member anthropometrist-trainees will be chosen by the Junta Comunitaria, appropriate materials and equipment ordered/purchased, operation manuals designed and produced and production of Gomez growth charts which should be durable

enough to last for at least five years in the keeping of the child's mother (providing a strong well-fitting plastic envelope with the chart is essential to its 5-year use.) This chart maintained by the mother may also include information which may be maintained by the collaborator/educator (person administering primary health care) and is a good record to be carried by the mother (parent) to the health clinic when seeking either preventive or curative nutrition/health care services. This card (standardized for use in health centers, too) will also be a tangible demonstration to the rural family of the link between the collaborator/educator and the health care center.

b) Phase Two. The training cycle for health educators will be initiated. Approximately 60 educators will receive one week of pre or in-service education in nutrition. (See Annex III E Timetable for Training Courses).

c) Phase Three. The health educators will renew their community work, incorporating nutrition information, and will train the designated anthropometrist volunteers who represent the communities for which the health educator is responsible. Up to ten anthropometrists will be trained in each one-week class. Immediately after the training, the growth charts, scales, tape-recorder-radios and cassettes will be distributed and their use instituted in the communities.

d) Phase Four. The health educators will conduct one-week sessions bringing the anthropometrists together with the rural health collaborators for in-service/continuing education for "nutrition enlightenment".

e) Phase Five, Ongoing Evaluation. The health educators, anthropometrists and rural health collaborators will participate in nutrition refresher courses every six (6) months during the life of the project. These refresher courses will serve the dual purpose of education and evaluation. The health educator will collect data from the anthropometrist on a regular basis and submit it to the nearest health center for input to CTAN's NEIS (Component Four.) CTAN will provide technical assistance as will an outside evaluator.

f) Phase Six, Final Evaluation. This intervention will be evaluated on its own merits and its relation to the development of community-based self-help. CTAN will provide technical assistance as will an outside evaluator.

3. Coverage. Approximately 350 communities are expected to participate and benefit from this anthropometric activity. These will generally be the same communities receiving PLANSAR and, in many case, INVIERNO services as well. Assuming an average community size of 350, Annex III E shows the year-by-year coverage targeted during the program period. Some 26,950 rural children 0-5 years of age are expected to benefit.

4. Timetable. Approximately four years will be required to implement the six phases of this component element. The anticipated timetable - by events and dates - is shown in Annex III E.

5. Inputs. A.I.D.-financed inputs to this component element will include i) commodities (e.g., scales, Gomez charts, tape recorder-radios, limited means of transportation for PRACS health educators), ii) in-country training for PRACS rural health educators, rural health collaborators and community anthropometrists and iii) limited technical services for evaluation. Total A.I.D.-financed requirements are estimated at $175,000. GON inputs are estimated at $110,000 and include faculty/supervision (PRACS), operating costs, maintenance, and related costs. The approximate allocation of A.I.D. and GON inputs is shown below in Table 7 with supporting details contained in Annex III E.

TABLE 7

ELEMENT I BUDGET

(In U.S.$ 000)

Use of Funds		Source of Funds A.I.D.	GON	TOTAL
i)	Commodities	95		95
ii)	Training	70		70
iii)	Technical Services	10		10
iv)	Operating Costs		110	110
	TOTAL:	175	110	285

6. Outputs and EOPS

a) The major expected outputs of element I will be:

i. 60 health educators trained in nutrition (20 per year plus 3 refresher courses.)

ii. 350 Volunteer Anthropometrists trained in weighing procedures working in 350 rural communities (120 volunteers per year plus 15 refresher courses.)

iii. 350 volunteer anthropometrists and approximately 120 Rural Health Collaborators trained together in nutrition education (approximately 160 per year plus 15 refresher courses.)

iv. Non-formal nutrition education information will be relayed to 350 rural communities with the potential impact of 122,500 people (350 per community.)

b) EOPS. Indicators of the expected EOPS include:

i. Approximately 4,900 children 0-1 years participating in the community based weighing program.

ii. Approximately 22,050 children 1-5 years participating in the community based weighing program.

iii) Approximately 80% of the mothers in the communities receiving nutrition information from the various community health workers.

iv) Increased referrals to the health centers for nutrition related services based on the field work of the health educators, rural health collaborators and anthropometrists.

b. Rural Community Anti-Parasite Campaigns.

1) Approach. This element of Component Three will increase the nutritional impact of PRACS/PLANSAR operations in approximately 350 localidades, through community-based anti-parasite activities. Such activities logically follow from and complement the extension of preventive health coverage efforts already underway in environmental sanitation and immunization. The anti-parasite activity is designed to decrease the incidence and prevalence of gastro-enteritis due to parasites. In Nicaragua, the principal causes of 42% of all deaths are related to infectious and parasitic disease exacerbated by endemic malnutrition (p. 44 Nutrition Sector Assessment).

Operations will focus on community-based evaluation and education and include treatment with anti-parasitic medication. The anti-parasite activity builds upon current PRACS/PLANSAR activities in that the same rural agents will be utilized as distributors of the anti-parasitic medicine. PRACS health educators and rural health collaborators are the primary implementing agents of this program at the community level. (See Element 3 below for health clinic distribution of anti-parasite medicines.) During their seven month basic training, the health educators develop skills in community health assessment, simple health treatment procedures, utilizing educational methodology, reporting and evaluation. Rural health collaborators, during their nine week basic training, develop skills in medicina simplificada or primary health care (first aid, simple treatment procedures). This element simply adds a direct impact nutrition intervention at the community level delivered by the health educators and rural health collaborators.

As the environmental sanitation situation improves in the communities with the support of core PRACS/PLANSAR activities, the case for providing community members having typical worm infection symptoms the prescribed dosage of a broad spectrum anti-parasitic medication along with health education is warranted. Distinction is made between parasitic infection with few, slight or no symptoms and parasitic diseases with definite clinical evidence of pathologic changes. The educator and collaborator will not be expected to make this distinction, but to distribute the anti-parasite medication to most community members after screening for the contingency of adverse reaction to medication.*

* It is not within the scope of this community-based element to extensively evaluate the effectiveness of the anti-parasite program by means of laboratory analysis. The persons whose symptoms are not relieved by the medication prescribed and distributed by the health educator and collaborator will be referred to the rural health center. The health center's capacity will be increased to respond to the referral (again, see Element 3 below).

Rather than a one shot campaign (practical for immunization but not depasitization), the medicines will be distributed by the GON so that the price is affordable to the MARP in the rural areas. This process has been tested by the MOH Division of MCH under the FP partera project with various drugs. In effect, the health worker obtains the drug from the GON and sells it at a price affordable to the rural poor. That price includes a "commission" which is the incentive of the health worker to continue the sales. Mebendazole, an anti-parasitic drug, has been a "fast-moving" drug in the partera kit. (A.I.D. Grant No. 524--139) and will be the drug utilized in this intervention. The PRACS educators and community collaborators will be the distributors of Mebendazole.

2) Phasing. The timing of the anti-parasite activity also consists of inter-related sequential phases.

a) Phase One. The PRACS instructors will revise their teaching manuals (curricula) for health educators and collaborators to include specific instructions for the use of anti-parasite medication. Appropriate methodology will be incorporated into the basic and continuing education programs. During this phase, educational materials will be designed and produced, equipment/supplies will be ordered/purchased and the administrative and budgetary procedures will be developed with respect to the drug supply system*. As well, limited sampling of stool specimens will be done in selected communities to establish a base-line useful in follow-up evaluation.

b) Phase Two. The training cycle will be initiated. As an in-service education activity, a two-day session will be held in which the indications for use and the sales/reporting mechanism for distribution of the anti-parasite medication will be taught.

c) Phase Three: The implementation of the anti-parasite program will be underway:

i) Community Sanitation education continues;

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* Center for Disease Control (Atlanta), trip reports indicate similar drug supply system methodology successful in Guatemala, "Direct Distribution Center", and El Salvador.

ii) Case finding of all persons in the community whether or not they demonstrate symptoms of parasitic disease.

iii) Treatment in the community with Mebendozale* and related health education.

iv) Referral to health center of treated individuals whose symptoms of parasitic infection were not responsive to simple treatment process.

d) Phase Four. Outside evaluation by CDC's Division of Parsitology (PASA Contract) is expected. CTAN's evaluation will assess the records of the collaborators and health educators with respect to the numbers treated for parasites and subsequent referrals. Both workers will submit monthly reports to the rural health centers including the names, ages and dates of those treated and those referred for follow-up after treatment at the community level.

3) Coverage. The Nutrition Sector Assessment (p.16) estimated 65% infection with parasites in rural villages (current estimates have shown nearly 100% infection). Again assuming an average population of 350 in the 350 target communities, the number of target group members directly benefitting from this activity could conservatively be estimated at nearly 80,000.

4) Timetable. Approximately 3-1/2 years are estimated as necessary to conduct the anti-parasite activity. Illustrative events and dates are shown in Annex III E.

5) Inputs. A.I.D.-financed inputs to this component element are estimated at $160,000 and will consist of commodities (mostly the drugs) as well as in-country training of rural nurses, health educators and collaborators. GON inputs will be operating costs, including drug storage and handling, maintenance, salaries

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* Center for Disease Control (DHEW) report "Effectiveness of Mebendazole Against Worms: Field Trial in El Salvador, 1976". A dosage of 100 mg/day x 2 days given in areas with high prevalence of intestinal helminthiases once every six months should eliminate diseases due to infections with intestinal helminths. (See Annex III E which indicates the most prevalence intestinal helminthiases in Nicaragua).

and evaluation expenses. They are estimated at $55,000. The tentative allocation of A.I.D. and GON funds to this activity is shown in Table 8 below, with back-up detail contained in Annex III E.

TABLE 8

ELEMENT 2 BUDGET
(In U.S.$ 000)

Use of Funds		Source of Funds A.I.D.	GON	TOTAL
i)	Commodities	135		135
ii)	Training	10		10
iii)	Technical Services	15		15
iv)	Operating Costs		55	55
	TOTAL:	160	55	215

6) Outputs and EOPS

a) Outputs. The major expected outputs of this activity include:

i) Curriculum of health educators expanded to include specific instructions on the indication for and use of anti-parasite medication.

ii) 60 rural health educators trained in the use of the anti-parasite medication Mebendazole and involved in a mass distribution program.

iii) Curriculum of volunteer rural health collaborator expanded to include specific instructions on the indications for and use of anti-parasite medication.

iv) 120 rural health collaborators trained in a distribution methodology for anti-parasitic medication which has a financial incentive built into the sales mechanism.

v) 45 rural health nurses specially trained with respect to the epidemiology of parasite infections and the massive use of Mebendozole in the rural areas.

vi) An estimated 350 community members per village or approximately 100% of the population in the PRACS/PLANSAR communities will have access to anti-parasite medication at the community level. This represents approximately 122,500 beneficiaries.

b) EOPS. The expected EOPS will be the acceptance by all parties of this approach to parasite control and its replication for the benefit of the target group in additional communities after the program period.

c. Rural Community Supporting Services

1) Approach. This element is designed to i) upgrade the diagnostic and therapeutic services of the rural health centers and health posts and to ii) extend their "catchment" (outreach) areas in order to reduce the prevalence of nutrition-related health problems among the rural poor. In particular, the activity will improve the primary health care services pertaining to nutrition in approximately 37 rural health centers and eight (8) health posts in Regions II and V, excluding the Department of Managua*. The criteria for selection will be determined by the foci and timing of other development activities such as INVIERNO, PLANSAR and the National Health Delivery School (see coverage rings in map of Annex III A). In an effort to improve the nutritional status of the MARP, this activity will concentrate direct nutrition interventions to decrease morbidity and mortality with particular attention to gastroenteritis and iron deficiency anemia/nutritional anemia.

This MOH effort will complement ongoing (Health Loan) and planned community-based activities in the following ways. i) At the end of project, target health centers will be able to more effectively provide back-up support to the nutrition/health services provided by health educators, rural health collaborators and the volunteer anthropometrists. For example, back up functions

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* Annex III E lists the MOH health centers and posts in Regions V and II.

for the anti-parasite activity and growth assessment will be affiliated with the participating health centers. ii) Control of inventory of drugs at central supply center, health center/post and community-worker level will be managed centrally by a "small business computer". Computer records will demonstrate the supply and demand of drugs for the centers - decreasing losses and mishandling. iii) Human resources development in health is now centrally programmed through the Institute of Human Resources in Health (Component II of Health Loan). The Institute, in effect, monitors the supply and demand of health workers and will assist in the determination of which centers can best utilize what human resources, and when, in conjunction with the MCH/FP office of the MOH. iv) Among the health centers/posts to be improved are those where students of the National Health Delivery School will receive their clinical/practical experience in rural community health and nutrition. The National Health Delivery School - to be located in Diriá, Granada Department - will be affiliated with various health centers/posts in Region II and the NHDS Matagalpa campus will be associated with health centers/posts in Region V. v) Nutritional impact to be evaluated by CTAN with the Nutrition Evaluation and Information System (NEIS) (Component Four below) will measure the health center/post outputs directed at decreasing morbidity and mortality secondary to malnutrition. vi) Parasitic infections can be diagnosed, treated and reported (epidemiological surveillance) to the Department of Epidemiology. vii) New food recipes developed during the program period can be demonstrated in the centers using the nutrition-related equipment and supplies (i.e., preparation of super-limonada, formulas and, possible, supplementary foods*). These are some of the mutually-reinforcing aspects expected from this element. More specifically, it will provide funds to focus on the nutrition related health problems of the MARP. The following activities will be supported.

a) Training of 45 rural health nurses which will include procedures for distribution of vitamins/minerals, anti-parasitic medication, food demonstration, and the Gomez Growth Chart methodology and the importance of child spacing on the birth weight of subsequent children and lactating ability of the mother. Part of this training will be a briefing on the role of anthropometrists and the expanded role of the health educator and rural health collaborator with respect to nutrition interventions and the role of CTAN. The nurses will receive continuing education in nutrition every six months. They will be encouraged to collaborate with MOH's SERN (Nutrition education and recuperation center) workers (see Component I).

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* Perhaps jicaro-based.

b) Training of 20 rural health laboratory technicians in laboratory procedures for detection, identification and reporting of parasitic infections, nutritional anemias, etc.

c) Vitamin and mineral supplementation program for prenatal women and postnatal women.

d) Program for weighing and measuring the 0-5 year olds, utilizing the Gomez Growth Chart. All mothers would retain a copy of the individual child's growth chart (and immunization chart) for assessing progress. This will reinforce the Element I approach in the community.

e) Vitamin supplementation activity for 0 - 5 year olds (based on growth chart assessment.)

f) Nutrition education activity which revolves around demonstration in the clinic of i) Super-limonada preparation, ii) formula preparation and iii) supplementary food preparation.

g) Dispensing of drugs on a referral basis to those parasite cases treated but not cured in the anti-parasite program.

2) Phasing.

a) The nurses in the selected centers will be interviewed regarding the nutrition problems evident in their clientele and current nutrition interventions practiced, if any. They will be "sensitized" to the need for nutrition counseling for the MARP during in-service training courses. As well, the rationale for the new interventions will be discussed in relation to the nutritional status of the population. The Divisions of MCH and FP were recently combined in the Ministry of Health and the former director of FP now heads both divisions. This division, considering its current experience with the partera (indigenous midwife) training project, is familiar with the process of "sensitizing" MOH health workers to the new functions (i.e., responding to referrals by parteras and resupplying parteras' kits). The kits include vitamins and anti-parasite medication as well as contraceptives, etc. The laboratory technician trainees during their laboratory training will be encouraged to understand the relationship between their work and the nutritional status of the expanded population to be served.

b) Improvements in Health Centers to Provide Nutrition Related Services*. The MOH will expand its primary health care services at the level of the health clinic to include nutrition intervention in 45 health centers/posts during 3-1/2 years. Additional nurse supervisory staff time will be assigned to the program as a result of the expanded operations. The drug mix for the center/posts will be determined on an individual basis depending on the epidemiological/medical assessment of need by the MOH.

c) National Health Delivery School Involvement. As the MCH program of these centers improves, students from the NHDS (both campuses) will be assigned to various clinics for their rural public health experience. Prior to and during this time, technical assistance will be available to develop this part of the non-didactic training experience. Limited nutrition-related equipment and supplies will be procured for the NHDS.

3) Coverage. The expected impact of this component element upon the MARP is shown in Annex III E. Estimates of the expanded coverage to be provided through the first ten health centers (five each in Regions V and II) amounts to around 23,280 members of the MARP. The calculations of coverage do not include FP patients nor 6 - 14 year olds who are also eligible for MOH center services but who are not counted among the MARP.

CTAN, responsible for coordination and evaluation of nutritional impact efforts, will help evaluate these nutrition interventions through the NEIS. One methodology to be employed will be an investigation of how many health clinic visits represent mothers who maintain growth charts for their children. This will help to quantify the effectiveness of the growth charts as indices of case finding and referral from the community to the health center/post.

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* In this regard, it is noted that A.I.D. will not be financing the construction of new health centers but will be expanding the nutrition related functions of clinics located and functioning in rural areas. For example, in the tentative list of the first ten clinics to be improved during year one of the project are seven A.I.D.-financed centers (constructed under Loan 524-L-023, October 1969 - February 1972.)

4) Timetable. Approximately 3-1/2 years will be required to implement this component element and to conduct an end-of-element evaluation. The anticipated timetable - by events and dates - is shown in Annex III E.

5) Inputs. A.I.D. financing for this component - estimated at $490,000 - will cover technical assistance, in-service training and related supplies for rural health nurses, auxilliaries and rural laboratory technicians, commodities (e.g. weight charts, portable stoves, scales, microscopes, etc.) as well as the drugs. GON inputs are estimated at $720,000. They will include operating, salary and maintenance costs of providing supporting services, drug commodities, handling costs and so forth. The approximate allocation of A.I.D. and GON inputs is shown below in Table 9 with supporting details contained in Annex III E.

Table 9

Element 3 Budget

(In US$000)

		Source of Funds		
Use of Funds		A.I.D.	GON	TOTAL
i)	Drugs	250	250	500
ii)	Commodities	140		140
iii)	Training	50		50
iv)	Technical Services	50		50
v)	Operating Costs		470	470
	TOTAL:	490	720	1,210

6) Outputs and EOPS

a) Outputs. The general output of this component element will be approximately 37 rural health centers* and 8 rural health posts appropriately

* All centers in Regions II and V excluding those in Managua Department.

equipped to provide a mix of clinical/educational/outreach services having direct nutritional impact on the MARP. The health workers assigned to the centers will have received in-service training and "sensitization" to mechanisms by which to improve nutritional status of the MARP. More specific outputs include:

i) 45 rural health nurses/auxilliaries trained in specific nutrition interventions which relate primarily to the reduction of maternal mortality and morbidity and mortality and morbidity in the 0 - 5 population, secondary to vitamin and mineral deficiencies, gastroenteritis due to parasitic infections, and inadequate spacing of children. (The training will include approximately four (4) in-service training courses of one week duration and 10-3-day refresher courses).

ii) 20 rural laboratory technicians trained with particular attention to stool specimen and blood analysis to detect and identify parasitic infections and nutritional anemia. (The training will include approximately 2 three month courses and 8 one week refresher courses).

iii) Weighing and measuring of children 0 - 5 and maintenance of a Gomez growth chart in duplicate (copy for clinic and mother). This will represent approximately 800 children per clinic from surrounding larger localidades during the life of the project.

iv) Distribution of vitamin, mineral and folic acid supplementation to all pregnant women receiving prenatal care in the health centers/posts. (See Annex III E graphs demonstrating increased nutritional needs during pregnancy and lactation). This represents approximately 200 women per year per center or 16,000 women during the project.

v) Distribution of vitamin and mineral supplementation to all lactating women receiving post-natal care (and health services for their infants) in the health centers/posts. This potentially represents 200 women per year per center or 16,000 women during the project (particularly considering increased referrals from the community health workers).

vi) Distribution of vitamins to the 0-1 and 1-5 year olds. This represents potentially 200 0-1 year olds per center per year (or

approximately 60% coverage) and 600 1-5 year olds per center per year (or approximately 40% coverage.)

vii) Distribution of anti-parasite medication to cases both referred to and detected in the clinic. The potential clinic population (MARP) to be served per clinic is 1000-1200 MARP per clinic per year (200 0-1 year olds, 600 1-5 year olds and 200-400 pregnant/lactating women).

viii) Promotion/demonstration in the health center/post of preparation of super-limonada or other nutritious foods. This activity may be performed by a variety of people including the health educator, nurse, health collaborator, regional nutritionist, social worker, etc.

b) EOPS. The anticipated EOPS will be the successful installation of the above mechanisms in target centers and posts, acceptance of them, and the subsequent replication of these MARP - serving mechanisms to other centers, posts and regions.

3. Component Budget. Aggregating inputs from the above three elements of this component, the tentative and illustrative budget is shown in Table 4.

Table 10

Source of Funds
(in US$ 000)

Use of Funds		A.I.D. L	A.I.D. G	GON	Total
i)	Commodities*	620		250	870
ii)	Training	130			130
iii)	Technical Services		75		75
iv)	Operating Costs**			635	635
v)	Inflation-Contingency***	85	--	--	85
	TOTAL:	835	75	885	1,795

* Includes drugs.
** Exclusive of CTAN costs.
*** Approximately 11% of loan inputs.

Grant funds (approximately $75,000) will be allocated to this component in accordance with the criteria set forth in Part I E.

5. Component Timetable. The phasing and timetables for the three elements of this component are described above. See Annex III E for supporting detail.

Component Four, Evaluating Nutritional Impact.

1. Constraint to Nutrition Improvement. In recent years, it has become apparent that malnutrition must be viewed in the context of the wide variety of social and economic factors which condition nutritional status and not strictly as a health problem. This new outlook is based on the findings that: i) an exclusively health-oriented approach to combating malnutrition is not as effective as an integrated multisectoral approach; ii) programs and policies previously thought to be totally unrelated to nutrition may have considerable impact on nutritional status, either positively or negatively; and iii) in order to effectively combat malnutrition, the impact on nutritional status of policies and programs in all sectors must be measured to facilitate design of more effective programs.

The recognized need to measure progress has given rise to the idea of systems which provide continuous information with multiple objectives in mind, namely: i) determination on a recurring basis of the incidence, prevalence and severity of nutritional problems; ii) provision of basic information concerning socio-economic determinants of nutritional status and the level of coverage of basic services related to the amelioration of nutrition problems; and iii) institutionalization of continual evaluation of the efficiency and effectiveness of programs and policies which impact upon nutritional status and feedback of the findings into the planning and implementation process of NFNPs. This built-in-data-generating, evaluation and feedback system is the basis for the Nutrition Evaluation and Information System (NEIS) in Nicaragua.

At present, most institutions and agencies in Nicaragua collect field data for their own internal purposes. The MOH collects quantitative information concerning the incidence, prevalence and severity of various nutritional problems without also documenting changes in socio-economic variables which influence nutritional status such as incomes, food production, etc. Agricultural field data rarely if ever include indicators of nutritional status. The limited coverage and outreach of certain data-collection systems such as civil registries and health clinics pose a constraint in obtaining complete and reliable information of actual conditions in the entire country. A large number of both private and governmental agencies involved in nutrition-related activities collect similar data in complete isolation of each other. Non-standardized methodology for data collection purposes prevents

use of data for comparative purposes. Lack of awareness and motivation as to the potential utility of the information promotes inaccurate data reporting, incomplete tabulation and analysis of collected data, and lack of feedback into the system.

In spite of the problems caused by these factors, the infrastructure for establishing NEIS exists in Nicaragua. The major constraints to be overcome here in establishing an efficient system for data collection, analysis and feedback to target group programs are: i) lack of an organized administrative and logistical framework for data collection, processing, analysis and feedback; ii) lack of a standardized methodology for data collection; iii) inadequate supervision in the system; iv) lack of clear objectives for existing data collection resulting in the collection of useless data and the omission of pertinent data; v) inadequately trained field and service delivery personnel for data collection purposes; and vi) poor coordination, communication and exchange of field information between institutions which, individually, have limited coverage and outreach but, collectively, have relatively broad coverage. A coordinated approach could overcome these constraints, thus helping eliminate the bottleneck to meaningful planning and action for nutrition improvement among the target group.*

A continuous monitoring system of project impact for problem identification and causality determinations is considered essential for effective planning. It has been general practice in many countries to evaluate a project in the final stages or at the very end of the implementation phase. This approach does not permit the flexibility necessary to alter project design during the implementation phase in response to indications of unsatisfactory project impact upon intended beneficiaries. In addition, static data collection activities, such as surveys, usually serve as the basis for project design and implementation, often a year or more later, at which time field conditions may have changed. A system which provides information on a continuous

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* In this regard, the pursuit of adequate nutrition is mixed. While the basic ingredient for it (food) must generally come from the private sector, public sector intervention is required to provide the opportunity for adequate nutrition, perhaps the most basic human right.

basis enables the planning machinery (public or private) to be responsive to real conditions.

2. Detailed Component Description. The Nutrition Evaluation and Information System (NEIS) (element 1) will be the core activity of CTAN. CTAN will also manage one evaluative/research activity pertaining to the nutritional implications of general government (especially agricultural) policies (element 2), in addition to short and medium-term training of rural agency personnel responsible for planning, implementing and evaluating nutrition activities which impact on the rural poor (element 3).

a. Nutrition Evaluation and Information System (NEIS).

1) Approach. The NEIS will establish a mechanism for the continuous flow of reliable information from the field to the planning level (CTAN) and back to the field. The mechanism is designed to "pick-up" the information generated by the various community level field projects involving A.I.D., GON and community inputs. (See Annex III F for Flow Diagram of the NEIS.) The system will enable CTAN to:

i) Obtain data on a recurring basis of the incidence, prevalence, and severity of nutritional problems and the socio-economic determinants of nutritional status to assist in the design of effective programs;

ii) Obtain data on a continuous basis for monitoring and evaluating programs which have an impact on nutritional status;

iii) Obtain "early warning signals" of potential nutrition problems in specific regions of the country in order to take immediate ameliorative action;*

iv) Provide the various planning and operational levels of service delivery institutions with timely, reliable and useful feedback about the nutritional

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* If drought or flooding is either projected or detected, the improved emergency food plan to be developed under Component Two would be activated.

impact of their projects, thus facilitating adjustements in such projects to increase their nutritional effectiveness;

v) Serve as an information analysis and dissemination center for all agencies and institutions involved in activities which can have an impact on nutritional status; and

vi) Coordinate and motivate individuals working in nutrition-related activities at both the planning and operational levels in all agencies, institutions and communities involved in the NEIS.

The system will report changes in nutritional status and related socio-economic variables, some of which are subject to influence by program interventions in various sectors. Analysis of the changes and other data will indicate relative success or failure of those interventions attempting to improve nutritional status. The information system will not, by itself, provide the reasons for project success or failure, nor tell how to improve performance. That must come from careful monitoring and evaluation of each program activity. Consequently, each component of the program will be evaluated on its own merits as a part of the NFNP.* Those evaluation plans are mentioned in each component chapter of this program and in Part V, D, Evaluation.

The NEIS is comprised of five inter-related parts: i) Baseline Data; ii) Data Flow; iii) Training and Supervision; iv) System Implementation; and v) System Validity. Taken together, they will develop and utilize a Nutrition Data Bank for purposes of ongoing program evaluation, modification and planning. In this connection, CTAN will publish a Food and Nutrition Newsletter (at least three issues per year) for distribution to concerned agencies, both public and private. Each part of the NEIS is fully described in Annex III F.

2) Inputs. Inputs to Component Four of the program will be financed by two sources, GON budgetary allocations to the MOH and A.I.D. grant and loan funds. (CTAN's budget is derived primarily from allocations from the

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* National Food and Nutrition Plan.

MOH, except for salaries paid to CTAN personnel, serving as liason officers from the other sectors, by the parent ministry). Inputs by source and the estimated budget for Element 1 are the following:

a) GON Inputs. Estimated GON inputs are shown in Annex III F. These inputs include support for salaries, materials and transport costs related to seminars, training of personnel, data collection, supervision and periodical check surveys. Also included is the purchase of additional measuring equipment, and international fares for external training . GON inputs for NEIS are estimated at about $242,500.

b) A.I.D. Inputs. As also shown in Annex III F, A.I.D. inputs to Component Four will consist of the purchase of measuring equipment, outside technical assistance, and materials and logistical support for training, seminars involving participation of rural agents and the target group,* data collection, supervision, and periodical check surveys. Total A.I.D. inputs for NEIS are estimated at about $264,500.

3) Timetable. The following NEIS activities are listed in the order in which they are expected to begin.

	Description of Activity	Date to Begin
a)	National Nutrition (Baseline) Survey	
	i. Training of survey team members**	by August 1977***
	ii. Data Collection	by August 1977

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* For example, rural health collaborators, anthropometrists, et. al.

** Since the survey team members were already trained for the pilot survey, it is estimated that the retraining and final briefing will require only one week.

*** All activities starting in CY1977 are supported under Nutrition Program Development Grant No. 524-0117. (See Annex II H.)

	Description of Activity	Date to Begin
	iii. Data Processing	by October 1977
	iv. Data analysis, interpretation and report preparation	by November 1977
	v. Dissemination of survey results	by December 1977
b)	NEIS - Central Level Planning	
	i. Redesign of forms used in on-going data collection system	by September 1977
	ii. Preparation of operating manuals	by September 1977
	iii. Motivational and training seminars of institutional operational personnel	by October 1977
	iv. Selection of nutritional status indicators and development of evaluation and supervision	by November 1977
c)	Course on "Nutrition Planning"	by March 1978
d)	Implementation of NEIS in Region V.	
	i. Training of field personnel	by January 1978
	ii. Motivational seminars	by February 1978
	iii. Field Implementation of the NEIS	by March 1978
	iv. Supervision	by March 1978
	v. Analysis and dissemination of the information (feedback) (every 4 months)	Round I by July 1978 Round II by November 1978 Round III by March 1979
	vi. Evaluation of the system's operations	by September 1978
e)	Implementation of NEIS in Regions II and IV.	
	i. Training of field personnel	by January 1979

Description of Activity		Date to begin
ii. Motivational Seminars		by February 1979
iii. Field Implementation of the NEIS		by March 1979
iv. Supervision		by March 1979
v. Analysis and dissemination of the information (feedback) (every 4 months)	Round I	by July 1979
	Round II	by November 1979
	Round III	by March 1980
vi. Evaluation of system's operations		by September 1979

f) Implementation of NEIS in the Remaining Five Regions

i. Training of field personnel		by January 1980
ii. Field Implementation of the NEIS		by March 1980
iii. Supervision		by March 1980
iv. Motivational Seminars		by May 1980
v. Analysis and dissemination of the information (feedback) (every 4 months)	Round I	by July 1980
	Round II	by November 1980
	Round III	by March 1981
vi. Evaluation of the system's operation		by September 1980

4) Outputs and End-of-Element Status

o) Outputs. The major expected outputs of Component Four's NEIS will be:

i. a comprehensive and timely national nutrition survey which provides update quantitative information on the prevalence and severity of malnutrition and the socio-economic factors which condition nutritional status;

ii. a set of nutritional status indicators which are sensitive enough to reflect changes in conditions in the country;

iii. evaluation of the information content and logistical/

administrative infrastructure of on-going field data collection systems operated by various institutions in the country;

iv. manuals prepared on standardized methodology and procedures of data collection;

v. a minimum of 10 government institutions linked into the NEIS;

vi. a minimum of 726 personnel trained in standardized data collection and reporting;

vii. reports, in the form of a published newsletter, routinely prepared by CTAN (every four months) to provide feedback to operating agencies about the impact of their projects;

viii. a minimum of 504 field collection points involved in the NEIS;

ix. a minimum of 450 weighing scales and 150 height boards distributed and adequately utilized;

x. reliable data on nutritional status in the entire country stored on magnetic tapes for subsequent research/analysis;

xi. routine usage of collected data for analysis, evaluation and planning at the CTAN level;

xii. continuous evaluation of the impact of projects on nutritional status, including those projects implemented under the loan, and their modification as necessary.

b) End of Element Status. The end of element status will be the operation of a national Nutrition Evaluation and Information System in the entire country, which provides reliable information on a continuous basis from approximately 504 field collection points to the CTAN planning level for analysis and feedback to

approximately 10 participating government institutions at both the planning and operational levels. Under the direction and supervision of CTAN, data reporting, collection, processing, analysis, storage and subsequent feedback will be standardized and institutionalized in the entire country. As a result of the NEIS, there will be close cooperation and collaboration between institutions involved in nutrition-related activities, and the institutions will be more responsive to the dynamic national program conditions and will be programming and implementing better for target group impact. More specifically it is expected there will be a demonstrated change of nutritionally related program priorities and budgets which reflect the statistical information and subsequent analysis - evaluation-recommendations that result from the NEIS.

b. Evaluation of Sector Policies on Nutrition.

1) Approach. The need to study the nutrition impact of government policies is emphasized in the World Food and Nutrition Study: The Potential Contribution of Research, National Academy of Sciences, 1977 (Annex III F).

In Nicaragua, the final results and recommendations of the CTAN-sponsored National Food Distribution Study, due in late 1977, will identify nutrition-related policies in the agricultural sector. CTAN's economist and attorney, experienced in nutrition planning - and in technical cooperation with MEIC, MOA and Banco Central (or other such as INCEI) - will analyze the policies, laws, measures, projects and programs whose implementation affect, directly or indirectly, the nutritional objectives and goals of the NFNP and, more specifically, the nutritional status of the MARP. Non-CTAN lawyers and economists will work with CTAN to develop position papers pertaining to various policies.* The position papers will serve to better inform the CIPAN as they carry out the national nutrition policy and the various programs focused on the MARP.

2) Inputs. GON inputs for policy evaluation are estimated at $20,000 which includes primarily non-CTAN technical assistance (18 person months or 6 people x 3 months plus other costs).

A.I.D. grant and loan inputs are estimated at $38,000 which include primarily technical assistance.

3) Outputs and End of Element Status. The policy review activity will have examined current policies with nutritional impact (both favorable and unfavorable). CTAN position papers produced for CIPAN executive level considerations and decision making. At least three position papers will provide the following technical analysis on a policy specific basis:

*For example, wholesale/retail food pricing mechanisms, basic grain support price policies, etc.

i) History of policy.

ii) Relative priority of its impact with respect to achieving the objectives of the National Food and Nutrition Policy objectives.

iii) Favorable nutritional effects.

iv) Unfavorable nutritional effects on the MARP.

v) Alternative policy to achieve the original desired positive results yet decrease/remove unfavorable nutritional effects.

vi) Methodology for alternative plan of action.

The papers will be presented and promoted in seminars given by CTAN for GON officials, decision-makers, and program directors to direct attention to them and facilitate serious considerations and decision-making.

c. Evaluation Training and Support.

1) Approach. Opportunities for external training program in evaluating basic and applied nutrition are increasing. This element will provide limited funds for nutrition and evaluation training and the exchange of technical information which will be divided among the different delivery institutions involved, including agriculture, food technology, education and health.

2) Inputs. The GON contribution will approximate $20,000 during the life of the project for travel expenses, etc.

The A.I.D. contribution will approximate $100,000 in loan funds during the life of the project.

3) Outputs. The participants while receiving training in various aspects of basic and applied nutrition evaluation will work on a specific project ("Thesis") related to the work they will be doing and the training goal. Upon completion of the training programs, this report will be presented to CTAN and interested agencies. Participants will return to their respective agencies better equipped to offer nutrition information and on-going evaluation services in an effective and efficient way to the target group.

3. Component Budget. The tentative and illustrative budget below aggregates the inputs of the three elements of this component, plus the entire estimated operating budget for the CTAN during the four year program period. The entire budget for the CTAN is included in this component for simplicity and because the majority of the CTAN staff time - at least during the latter years of the program - will be dedicated to the execution of this component, especially the NEIS. For the detail of the CTAN budget estimates see Annex IV A.

Table II

Component Four Budget

Source of Funds
(in US$000)

Use of Funds		A.I.D.		GON	TOTAL
		Loan	Grant		
i)	Commodities	20	21	7	48
ii)	Training Seminars	100	82	73	255
iii)	Technical Services (other than CTAN)		24		24
iv)	Operating Costs (other than CTAN)	130	23	202	355
v)	Total CTAN Budget (4 yrs)			1545	1545
vi)	Inflation-contingency*	25	--	--	25
	Total	275	150	1827	2252

Grant funds (approximately $150,000) will be allocated to this component in accordance with the criteria set forth in Part I. E. See Annex III F and IV A for supporting detail.

* Approximately 10% of Loan allocation to this Component.

D. Program Benefit Transmission Mechanisms

As indicated in the above component descriptions, the nutrition improvement program will deliver services and benefits to the target group through a variety of mechanisms. The program depends largely upon mechanisms already in-place under existing GON/AID rural sector programs in agriculture, health and (pending) education. Figure 3 on the following page illustrates these nutrition benefit transmission mechanisms for the poor living in small rural communities.

1. Phases. Conceptually, each mechanism operates in four phases:

   a. Community contact/organization by the service delivery agent;

   b. Community self-help and agent service delivery;

   c. Incidence of benefits leading to improved nutritional status; and

   d. Continued transmission of benefits through community and supporting structures as demanded by the target group.

FIGURE 3

NUTRITION BENEFIT TRANSMISSION MECHANISMS (4 PHASES)

(Rural Communities of Less than 1000 Population)

Agent/Activity →	PHASE 1: Community contact/ organization by agent	PHASE 2: Community self-help/agent service delivery	PHASE 3: Benefit incidence: contributors to improved nutritional status	PHASE 4: Community and supporting structures continue transmitting benefits demanded by target group
INVIERNO Agromoc	COMMUNITY DEVELOPMENT COMMITTEES	i) Credit to small farmers/ enterprises ii) Technical assistance	Increased production, income, purchasing power	Small farmer cooperatives INVIERNO → Banco Nacional
PRACS Educator		i) Non-formal H/N education (15 basic concepts) ii) Community surveillance of MARP iii) Anti-parasite services	Better food/nutrition/ health (F/N/H) habits	CRS - 1st aid, primary care Anthropometrist-Surveillance
PLANSAR Engineer		Environmental sanitation services i) potable water, ii) latrinification plus iii) garden irrigation	Improved health status; garden produce	Community maintenance
MOH Support Services		i) Immunization services ii) Anti-parasite services iii) MCH services	Improved health status	CRS MOH centers/posts
INVIERNO Social Promotor		i) Family gardens ii) Pilot Home Food Projects iii) Non-formal H/N Education	Increased food availability; Better F/N/H habits	Rural families
CTAN Support Services i) NEDS (education) ii) NEIS (evaluation		i) Mass media msgs/mat'ls (15 concepts) ii) Food show (regional recipes) iii) Training of Advice-givers	Better F/N/H habits	NEDS NEIS
Ministry of Public Education		i) Formal primary education including i) H/N curriculum, ii) school gardens	i) Better F/N/H habits iii) Increased food availability	Local primary schools
National Interventions:	i) Salt iodization for goiter reduction ii) Devl/dist of low-cost blended food		i) Improved health status ii) Increased food availability	i) Salt producers ii) Food distributors

2. Explanatory Notes (about Figure 3). The following observations are made about the Nutrition Benefit Transmission Mechanisms show above.

a. The descending list of agents, and the corresponding horizontal description of their activities, represents the approximate chronological sequence of actual penetration of rural communities, beginning with INVIERNO in late 1975-early 1976.

b. Actual delivery of services to a given community will depend on findings of joint agent/community "mini-surveys" of local resources (e.g. findings about nutritional status, water needs, educational needs, etc.) That is, each agent utilizes appropriate community selection criteria in tandem with other agents.

c. Actual incidence of benefits will be measured by the Nutrition Evaluation and Information System (NEIS) described in Component Four.

d. Quantitative estimates of beneficiaries are contained in coverage projections of Components One, Two and Three.

e. Several interventions of the nutrition improvement program will benefit the target group living in other than small rural communities of less than 1000 population. For example, mass media radio/materials , the Traveling Food Show, other nutrition education interventions, salt iodization, low cost blended food, etc.

E. Program Timing. Based upon GON-USAID estimates, and the approximate component timetables shown in Section C above and supporting Annexes, it has been determined that four years is a reasonable period in which to implement a people-oriented program of this complexity and magnitude. Conditions Precedent are expected to be met in late 1977 - early 1978. The program will thus be executed in calendar years 1978 through 1981.

PART FOUR - PROGRAM ANALYSIS

A. Financial Plan and Analysis

Table 12 on the following page shows the approximate allocation of A.I.D. loan and grant funds and GON counterpart funds to the program. As shown, the nutrition improvement program, will require an estimated $7,854,000 during the four year loan/grant period to finance and manage all aspects of the four components. A.I.D. will finance approximately 45% of the total cost ($3,000,000 Loan, $500,000 Grant) and around 55% or $4,354,000 will be funded by GON and private Nicaraguan sources.

The entire approach of the nutrition improvement program is oriented toward maximizing the nutritional impact of ongoing programs and maximizing the use of existing delivery mechanisms. Therefore, the prime incremental and recurring costs to result from it will be the costs of supporting the institution that has been developed to plan, coordinate and evaluate the program, namely the CTAN. CTAN was formed in August, 1976 to improve coordination between all GON and autonomous agencies in nutrition and to plan the NFNP.

The budget for the first nine months of operations starting 9-1-76 was $174,000 (see Annex II C for supporting detail). The projected current annual budget is $213,000, including direct hire salaries and the inter-agency "toping off" for some 20 employees. Annex IV shows current CTAN budgetary data.

The program could increase the present 1977 CTAN annual budget of $231,000 to a maximum of $446,000 in 1978 an increase of 193%. This figure is based upon the 1978 budget request prepared by CTAN. The Mission, however, considers this amount possibly high for a lean coordinating and evaluation unit.

Annex IV A Exhibit 4 shows the list of positions and staff level being sought by CTAN for 1978. It also projects the salary costs for the four year program if this staff level is accepted. Exhibit 3 of Annex IV A shows the entire 1978 budget request and provides one projection for four years on this basis. A second, lower but adequate, budget projection has also been made for the four year program period. These projections and staffing implications are all contained in Exhibit 3 of Annex IV A.

The projected annual totals for the CTAN budget are shown in Table 13 below. As can be seen, the estimated 1978 budget is 159% higher than the 1977 budget. This

TABLE 12

FINANCIAL PLAN ($000)

	COMPONENT I			COMPONENT II			COMPONENT III			COMPONENT IV			TOTAL			
	AID(L)	AID(G)	GON	AID(L)	AID(G)	GON	AID(L)	AID(G)	GON	AID(L)	AID(G)	GON	AID(L)	AID(G)	GON	TOTAL
Commodities	150	-	30	325	-	115	620	-	250	20	21	7	1105	21	402	1528
Technical Assistance	30	160	-	35	100	-	-	75	-	-	24	-	65	359	-	424
Training	120	-	35	-	-	-	130	-	-	100	82	73	350	82	106	540
Other Costs	960	15	1035	90	-	427	-	-	635	130	23	1747*	1180	38	3844	5062
Inflation/Contingency	140	-	-	50	-	-	85	-	-	25	-	-	300	-	-	300
TOTAL	1390	175	1100	500	100	542	835	75	885	275	150	1827	3000	500	4354	7854**

* Includes total probable CTAN Budget for FY 78-81 ($1,545,000)

** USAID = 45%, GON = 55%

includes the increased staff for the expanded workload during the program period and other startup costs which are not as great in subsequent years. From 1979 onward, we have projected roughly 10% increases in the CTAN, MOH and GON budgets.

Table 13
(US$000)

	1977	1978	1979	1980	1981
Projected CTAN Budget	213*	368	354	395	428
% Previous Budget	-	159%	96%	111%	108%
% MOH* Budget	.8%	1.2%	1.0%	1.0%	1.0%
%GON* Budget	.06%	.10%	.08%	.09%	.08%

* Assumed MOH & GON budgets will increase 10% annually.

Table 13 also shows how the projected CTAN budget relates to both the MOH and GON budgets. It is estimated that the CTAN budget will level off at about 1.0% of the MOH budget.

The recent historical budget for the Ministry of Health, through which CTAN is financed, is shown in Table 14 below. The total health budget (see Exhibit 2 of Annex IV A) has increased from $23.9 million in 1974 to $28.9 million in 1977. This

increase represents a 21% increase over the 4-year period or an average increase of 5.3% per year versus a 10.5% average increase in the total GON budget. The increase (decrease) percentages for the MOH budget are as follows: 14% for 1975, 1% for 1976 and 8% for 1977. The lower relative increment of the budget attributable to health, 5.3% as compared to the 10.5% average per year of the total GON budget is due principally to Managua reconstruction priorities and increased debit servicing as a result of the earthquake. In the 1977 budget, MOH ranks in fifth place with the Ministry of Government. MOE as first, MPW second, MOF as third and Ministry of Defense in 4th place.

Table 14

Comparative Budget Breakdown
(US$000s)

	1974	1975	1976	1977	1974/77
Ministry of Health Budget					
Amount	23,855	27,109	26,825	28,897	
Yearly Increment		3,254	(284)	2,072	5,042
Percentage Increase		14%	(1%)	8%	21%
Percent of Total GON Budget	9.8%	10.1%	8.4%	8.3%	-
Gov. of Nicaragua Budget					
Amount	244,342	268,843	317,595	346,795	
Yearly Increment	-0-	24,501	48,752	29,200	102,453
Percentage Increase	-0-	10%	18%	9%	42%

The total GON budget (Exhibit 1 Annex IV A) has increased from $244,3 million in 1974 to $346.8 million in 1977 representing an increase of 42% over the 4-year period or an average increase of 10.5% per year. The highest percentage increase, 18% over the previous year, was in 1976. (See Table 14 for 1974-1977 budget trends.)

Public Debt servicing as a percent of the total GON budget has been increasing at a very high pace. Debt servicing represented 9.9% in 1974, 14.2% in 1975, 16.3% in 1976 and 18.1% in the 1977 budget. However, due to an excellent balance of payments situation, the debt service ratio to exports of goods and services has remained at or below 13%, which represents above average performance for the decade of the 70's in comparison to most LDC's. At the same time Nicaragua's reserve standing with the IMF continues to improve with international reserves at the end of 1976 at a level of $176 million.*

Summary Conclusions. The incremental recurring costs expected to be generated by the nutrition improvement program are, for the most part, represented by the probable CTAN budget projections. Estimated at about 1.0% of the MOH budget, it can be concluded that this does not represent an unmanageable additional financial burden.

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* See USAID DAP.

B. Technical Analysis.* The nutrition improvement program is judged to be technically sound and feasible from the variety of considerations summarized below.

1. General Program Considerations

a) The program flows logically from the Nutrition Sector Assessment with its orientation to the composite determinants of nutritional status, namely food habits, food availability and food utilization (essentially health status). The Program Components will simultaneously promote mutually reinforcing positive changes in each of these composite determinants of nutritional status.

Conceptually, an individual's nutritional status could be improved as a result of positive changes of sufficient magnitude in any one of the three composite determinants, if the negative impacts of the other two determinants are not overwhelming. For instance, if food habits and availability are satisfactory, but the burden of infection and diarrhea prevents adequate weight gain in an infant, elimination of the infection and diarrhea alone will cause an improvement in nutritional status. On the other hand, if improper food habits are changed, but food availability and/or physiological utilization of food consumed remain poor, then little or no improvement will be observed in nutritional status. In effect, nutrition education, agricultural production and health status are so inextricably linked that changes in one sector inevitably have repercussions on others. The GON's NFNP thus addresses the problem in a multisectoral manner and attempts to bring about concurrent mutually reinforcing positive changes of sufficient magnitude in each of the composite determinants of nutritional status.

b) The program is epidemiologically sound because it addresses the most severe manifestations of malnutrition in the target group. Virtually all activities are designed to lower the incidence of PCM, especially in the MARP. A low cost high-protein blended food will be tested as a supplementary source of nutrients for the target group. The public health problem of endemic goiter is expected to be virtually eliminated as a result of salt iodization. Along with efforts to increase food availability, extended coverage of multivitamin and mineral tablets (with iron) will lower the incidence of anemias among pregnant/lactating women. Fresh produce from

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* Much of the technical analysis is contained in the Component descriptions and supporting annexes.

family and school gardens will help reduce deficiencies of vitamin A and riboflavin, as will the possible fortification of a low cost blended food or other products.

c) To repeat, the program reinforces, and is reinforced by, current GON/A.I.D. rural development programs which also address many determinants of nutritional status of the target population. INVIERNO's efforts to increase rural incomes and the Rural Health Program's efforts to extend preventive health coverage are especially complementary. These ongoing programs and the pending rural education program provide a fertile framework for the integration of more explicit nutrition improvement activities.

d) The program is based on a strategy of community participation. As foregoing program efforts, the nutrition improvement program is community-based and self-help oriented to the maximum extent. The provision of opportunities and resources to the target group are most feasible when the community has control over the administration and use of them. This is clear both in terms of short-term impact and in terms of longer term attention to the localized problems and generalized poverty that are evidenced by malnutrition.

e) Public sector nutrition programs which intend to address all the important determinants of nutritional status must take a multisectoral, multidisciplinary approach. The GON has adopted this approach and has designed its Program accordingly. The CIPAN, CTAN, and the NFNP are all models of the multisectoral approach. Successful implementation of such a program at the community level requires considerable support from those who control resources and technical skills. Planning and coordination of the provision of resources from the various sectors involved in the program will be very important to impact effectively on the complex problem. The program thus provides technical and financial support for critical activities at various points in the system, beginning at the community and working back-up through the support network to CTAN. Activities in Components One, Two and Three illustrate this concept very well, with nutrition education provided at various levels in order to impact on food practices in the community and with food-increasing and nutrition-related health inputs provided in order to impact on the consumption and physiological utilization of food in the individual.

2. Specific Component Considerations (Costs and Technologies)

The bases of program cost estimates are presented above in the Component Description of Part III, Section C. Supporting detail is contained in the Part III

Series of Annexes. Program costs are judged to be firm and adequate to achieve the planned outputs. During program execution, however, minor shifts in the mix of inputs to be financed would be anticipated when and as needed to improve or increase outputs, thus furthering accomplishment of the program purpose. Technologies selected for the program have been tested and found appropriate to the Nicaraguan setting. These are briefly described below.

a) Component One. The PRACS' technologies for community organization and health education have been proven under the Rural Community Health Services Grant No. 524-0110 as have special techniques such as the escuela radiofónica. These low cost approaches to non-formal, community-level education are suitable for amplification and replication within the nutrition improvement program.

The effectiveness of mass media radio education in Nicaragua has been demonstrated by the super-limonada message campaign assisted by Manoff International with central A.I.D. funding. (See preliminary results of Nicaraguan campaign in Manoff International file in AID/W.) The airing of recently designed messages as well as the development of additional ones is judged feasible under the program. These messages will reinforce the non-formal education efforts of PRACS and others as well as provide considerable additional coverage, including the penetration of rural communities that are too costly to reach otherwise, e.g., small villages of less than 25 families that are inaccessible by vehicle.

The systematic development of non-formal nutrition education materials and the provision of short-term courses are relatively straight forward procedures. The integration of nutrition into primary grades 1-6 will reinforce Component One activities.

b) Component Two. The iodization of salt is technically understood and the implementation methodology has been tested elsewhere (e.g., Guatemala). As indicated, close monitoring of this intervention by the CTAN will be essential to assure follow-through by salt producers and impact upon the target group. The USAID's judgment is that CTAN possesses the technical capacity to monitor this regulatory activity.

The R & D effort to develop a low-cost high protein blended food makes both technical and economic sense. (See Economic Analysis of Part IV C below.) The objective of maximizing the protein content of the food and of

marketing it in bulk form through outlets accessible to, if not operated by, the rural poor make this program element an especially attractive one. As explained above in Part III, a logical, step-by-step R & D approach will be carried out to assure the selection of the best processing and distribution techniques in order to demonstrate, within the testing phase, the PCM-reducing potential of an acceptable low-cost, high protein blended food. Component Two contains other R & D activities and pilot endeavors. These are technically designed to investigate and demonstrate the feasibility of conducting food-increasing activities holding great potential for nutritional impact upon the target group but which are, as yet, untried in Nicaragua. The development of better emergency food distribution plans is needed for both efficiency and equity reasons.

c) Component Three. Programmatic efforts to increase the outreach of maternal and child health services as they apply to the achievement of nutrition-related objectives in selected program areas are technically feasible. This assessment is made in the context of the improved human resources to be provided by the new National Health Delivery School (NHDS). The NHDS's two campuses will be located in rural or semi-rural areas. The curriculum is intended to be more responsive to the health and nutrition problems of the rural population. The outreach of selected MOH health centers/posts will be carried out by the field "agents" (health educators, etc.) trained to offer nutrition related education and services while the clinics will be better equipped with supplies and staffed by nurses with increased awareness of their "backstopping" role and increased clinical skills necessary to carry out the task.

d) Component Four. The value of the NEIS is that it will provide, on a continuous basis, information which is essential for program evaluation, modification and design through the use of existing infrastructure and existing human and material resources with a minimal requirement for technical assistance and equipment. The system will facilitate the expansion of the existing infrastructure to the community level by involving community level workers in the national data collection system. This community involvement in such a feedback information system parallels the model of the HIPS program of the PRACS project in Nicaragua and similar work undertaken in the Philippines.

The data flow component of the system, namely data collection, processing, analysis and feedback, depend on a smoothly functioning system, administratively and logistically. This part of the system should flow uneventfully after

the first several months of operation. The fact that the system will be "pilot-tested" in Region V for approximately twelve (12) months prior to implementation of the system in other regions will permit close observation and appropriate modifications in the system.

Although this system is designed to provide the best possible information on program progress and effectiveness, the difficulty of accurately measuring the impact of specific interventions on nutritional status should not be underestimated. Even the most carefully designed and controlled field experiments have great difficulty attributing observed changes in nutritional status directly to specific interventions, due to the influence of numerous variables and determinants. Nevertheless, this system will definitely produce three kinds of information of sufficient importance to the program to justify the investment in the system: a) measurements of changes in nutritional status of the population; b) measurement of changes in many determinants of nutritional status and c) measurement of delivery of program services intended to modify the determinants of nutritional status. Each of those sets of information will be required for program planning purposes and, taken together, will provide the planners with the best possible chance to learn the effects which program services are having on nutritional status of the target group.

The training and "motivational" seminars planned by CTAN are regarded as critical to achieving institutional collaboration and target group participation. These seminars will be given throughout the entire implementation phase of the NEIS. In addition to enlightening institutions as to the value of the system and how projects and policies from various sectors can impact on nutritional status, several sessions will teach personnel how to analyze, interpret and use the data in planning and designing projects in their own sector, and how to explain the meaning and value of the information to the community in terms of their welfare so that they can plan and initiate appropriate actions in collaboration with community workers.

3. Alternative Program Approaches Considered But Not Selected

The nutrition improvement program is based upon strategies contained in the GON's five year NFNP and is comprised of the initial set of interventions mutually judged as most feasible and promising for direct impact upon the target group. Other interventions and approaches were considered during the program development process but not selected. Some of these approaches are summarized below as well as the technical, financial or other reasons for not including them in the program.

a) Large-Scale Supplementary Feeding Approach. Resumption of a PL-480 Title II style supplementary feeding program was considered but ruled out on the grounds of i) its costliness (See Economic Analysis Section), ii) the historical tendency of such programs to be centrally controlled and administered rather than community-based, and iii) the mutual GON-USAID conviction that, for real and lasting effect, the nutrition improvement program should systematically seek to cause positive changes in the composite determinants of nutritional status rather than concentrate upon previously unproven approaches which, when and as terminated, are likely to have been unsuccessful in positively altering the underlying determinants of malnutrition.* For these reasons, the programmatic approach to developing a low-cost blended food and community-level nutrition projects was considered more appropriate for inclusion in the nutrition improvement program.

b) Extension of Nutrition Education and Recuperation Centers. (SERNS). As indicated in the Assessment, the MOH operates a system of 14 SERN centers that provide nutrition education and recuperation services. The investment of program funds in the improvement and extension of the SERN system beyond two weeks training in nutrition for SERN workers under this loan was considered but not chosen. Reasons include i) their "urban" orientation (most are located in towns of 10,000 population or more), ii) the extremely limited coverage (only 450 beds currently available), iii) their generally curative rather than preventive orientation and iv) their costliness. The mobile nutrition education approach of Component One was determined far more promising than the SERN approach to education. In addition, A.I.D. is supporting hospital improvements (including kitchen and feeding improvements) under the Rural Health Services Loan as will the IDB under its up-coming loan to the National Hospital System (JNAPS). As well, INCAP's Division of Applied Nutrition proposes technical assistance to CTAN to study hospital feeding. Such investments hold promise for substantially greater curative coverage for the third degree malnourished than would further extensive investments in the SERN system.

c) Urban Approach. The program essentially addresses the goal of nutritional improvement in the rural sector where poverty, with malnutrition

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* In this connection, the GON requested, in latter 1976, emergency food supplies to assist rural victims of the 1976 drought. The request was turned down by the country team, mostly on the basis of the reasons expressed above. The GON then went on to conduct a limited food-for-work program in the afflicted rural areas with its own resources.

as a common sympton, is being addressed by the GON strategy for IRD. For these reasons, explicit investments in nutritional improvement for the urban poor were not included. Nevertheless, certain program elements will, by their nature, deliver benefits to the urban malnourished. These elements include salt iodization, mass media nutrition education and the potential marketing of a low-cost, high protein blended food in urban as well as rural areas. The "spread effect" of such elements is especially appropriate, since substantial poverty and malnutrition exist in urban Nicaragua.

d) Agricultural Marketing System. As indicated in Part II D, the DIPSA arm of the Ministry of Agriculture is planning for a modern Assembly Points Marketing System. Consideration was given to assisting with the planning and initial implementation of that system as it pertained to nutrition. It was decided against due to the funding limitations of the nutrition improvement program as compared with the large funding that will be required to develop such a system. Separate financing will thus be sought by the MOA. The CTAN will subsequently assure that nutritional considerations are incorporated into the market system design.

e) Others. Numerous other program alternatives were considered but not selected for reasons of limited priority, low coverage, high cost, lack of potential for direct impact on the target group or lack of infrastructure.

4. Firmness of Cost. The cost estimates for each component were prepared from current manufacturer's catalogs, discussions with local suppliers, and consultants' reports. CTAN participated in cost estimation procedures. The approximately 11% inflation/contingency is included in loan allocations to accommodate the inflationary economic environment. Many of the loan funded activities will be conducted outside of Managua in areas with underemployment.

C. Economic Analysis

1. General Economic Considerations. Nutrition improvement activities such as those described in this paper are expected to be cost effective because (i) they are preventive oriented (rather than curative) and (ii) they are complementary to larger integrated rural development programs in agriculture, health and education. These advantages mean that a limited investment can be leveraged by considerable resources - both private and public - as well as help to avoid very costly recuperation requirements (or mortality.)

The highest impact element of the nutrition improvement strategy is the general rural development program designed to increase the income of, and services for, the rural poor, since malnutrition is most basically a function of poverty. The agriculture and rural health parts of the rural development program are already funded. Complementarity means that nutrition improvement will be a partial function of this program and a partial function of the others, making application of regular cost-effective or cost benefit analyses difficult, since expected benefits cannot, in all cases, be strictly attributed to interventions of the discretely funded nutrition improvement program. Some general statements, however, can be made about the efficiencies of the preventive and complementary approach selected by the GON and A.I.D.

a). Prevention. As was indicated in the Nutrition Program Development Grant Paper, the potential for cost-savings through avoiding hospitalization of third-degree malnourished children is in itself a convincing argument for investment in nutrition. "In 1975, 206,300 Nicaraguan children under five years of age were suffering from malnutrition, 5,500 of them from third degree PCM. By 1985, if no programs to improve this situation are undertaken, and assuming a 3% population growth rate, and similar proportions of malnourished children by degrees, there would be 303,100 cases of PCM in the same age group with 8,000 of third degree, and 70,700 of second degree. On the basis of these absolute increases, an average public cost of treating malnourished children (i.e., two hospital months at $15/day in the case of third degree) can be applied and a total additional budget burden derived assuming that the whole population is treated. For instance, just the cost of treating the additional 2,500 third degree cases in 1985 would be $2,250,000 (2,500 children x 60 days x $15.)"*

Other methodologies for quantifying the economic benefits of nutrition programs through prevention of malnutrition are available in the recent application of techniques from applied economics. One is the Marcelo Selowski approach of comparing the cost of milk used in supplementary feeding programs with the discounted flow of future incomes earned by a healthy, normally productive work force. Test results measuring reduction in mental and physical capacity due to severe undernutrition were used as the basis for postulating two different levels of future income. The social rate of return was high for investment in feeding type nutrition programs. Another approach - used by Alan Berg in "The economics of Breast Feeding" - was to compare the savings and consequent balance of payments impact of reduced milk imports to the costs of a campaign inducing greater breastfeeding by Chilean women. These two examples are

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* Nutrition Program Development Grant Paper, P.32.

relevant to the Nutrition Improvement Program, since the mass media and nonformal nutrition activities will focus upon extending breastfeeding for longer periods, thus tending to reduce the purchase of formulae used by urban mothers as well as the purchase of ingredients for atol* given to infants in rural areas. Also the R and D portions of this program will include development of a socially acceptable nutrition food blend which may be acquired at low-cost by parents to supplement children's diets. Further, the program includes high impact preventive health measures such as deparasitization and iron tablet distribution activities at the community level as well as salt iodization for goiter reduction.

b) Complementarity. While the relatively modest level of the loan/grant would not be expected, by itself, to affect the macroeconomic income redistribution required to significantly increase the quantities of food consumed by the poor, program activities are designed to affect and direct public investment on the one hand - through planning, information, and influence on other GON programs - as well as family income on the other hand, through education and the inducement of shifts within the distribution of family food consumption, so that the nutritional status of vulnerable populations is improved. The program is also intended to affect the family budget in situations of increasing incomes (as is expected with the INVIERNO program) so that a significant part of increments are spent on nutritious foods. By increasing the focus on nutrition within ongoing public efforts, the program will make efficient use of much larger investments in agricultural production, selected food production (garden crops and small animals), formal education curriculum development, maternal child health and sanitation, family planning and general home and farm extension programs. The orientation of ongoing expenditures to nutritionally vulnerable groups and to the production of appropriate and nutritious foods are expected to have high payoffs. They will be enhanced by modest investments in evaluation and information services.

Significant results are also expected from the nutrition education component which will encourage families to use available income more effectively in terms of nutritional impact and, in some cases, to invest in sanitation improvements or other health-related measures. Such results are particularly beneficial when severe malnutrition or related diseases are prevented and savings are produced by avoiding medicines, hospitalizations, or lost work time (and preserving human resources). When

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* Atol is a gruel made from corn or rice and water or milk (if available).

such expenditures are reduced, income available to improve the family diet is increased. Selected considerations of cost-effectiveness are contained in Annex IV B. Topics covered include i) nutrition education and ii) subsidized feeding alternatives.

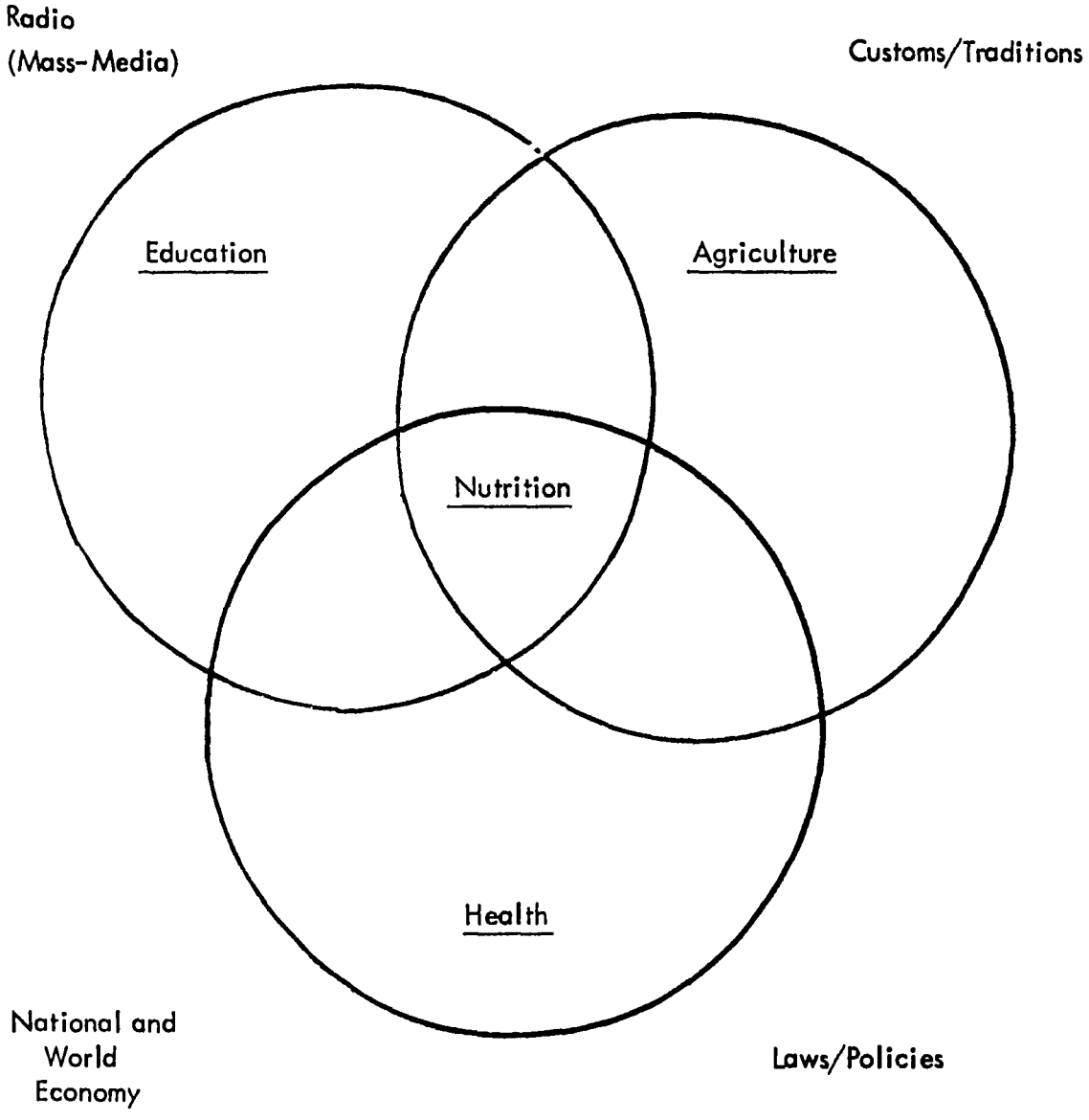
2. Macro-Economic Analysis. The updated macro-economic analysis is also contained in Annex IV B.

D. Social Soundness Analysis. The generally "software" nature of this program is not expected to generate untoward social consequences. There are various government and private sector interests involved thereby decreasing the chances of nutrition "working in a vacuum". CTAN serves as a technical resource to primarily four ministries designated as the GON implementing agents of the various loan and grant subprojects. As well, CTAN will coordinate with the public and private sector in high priority research, putting special emphasis on investigations likely to produce workable results in the near future. Included are such categories as improving food storage systems, developing new food sources (fish ponds, etc.), and research on the implications for nutrition of general government policies.

Diagrammatically illustrated in Figure 2 (Component I) is the public/private system which will be responsible for providing nutrition education and service inputs to the target communities. The system depends on community self-help using the services of community based change-agents. Various change-agents will be "enlightened" to the value of nutrition and its relationship to food production, storage, marketing, distribution, food preparation and physiological utilization. The roles of the various community based agents are easily differentiated on paper but in practice possible confusion arising over job description definition and responsibilities may be a possible deterrent to achieving the expected program outputs at the community level. Therefore, it will be a vital function of the trainers to bring together the various community based workers (e.g., rural health collaborators and anthropometrists) at the outset to assure them that no one person is designated "in charge of nutrition" in a community. By definition, nutrition is dependent on agriculture, education and health and is thus not a mutually exclusive event/function. Agriculture, education and health have their unique sphere of influence and responsibility yet are also necessarily complementary activities. The community based program efforts and field workers will focus on the intersection of all three in the process of integrated rural development. Figure 4 below demonstrates nutrition's multisectoral nature.

FIGURE 4

COMMUNITY/ENVIRONMENT



When considering the purpose to goal level of the logical framework and the prospects for "spread effect" one major underlying assumption of this program worth reiterating is that the GON continues to support its integrated rural development activities. Success of nutrition improvement efforts aimed at the rural MARP depends on GON and community willingness to pay the costs (to furnish with funds or means for maintenance) of integrated rural development.

E. Program Impact on Women. The nutrition program, a multi-purpose effort with complementary objectives, is targeted to benefit women through direct and indirect mechanisms.

1. Direct Impact

a) Decreased maternal morbidity and mortality attributable to improved pre-natal and post-natal services (e.g., nutrition counseling, multi-vitamins with minerals and folic acid.)

b) Increased level of understanding nutrition as a result of education/training focused on nurses, health educators, rural health collaborators, agronomists (agriculture extension workers), laboratory technicians, INVIERNO social promoters, anthropometrists, informal community leaders, primary school children and community members.

c) Increased productivity and sense of well being and decreased protein-calorie malnutrition due to consumption of low cost blended foods, patio crops and/or school garden produce.

d) Increased nutrition in food for family consumption due to better practices regarding food selection, food preparation practices (use of nutritious recipes), personal hygiene, and food storage.

e) Decreased prevalence of parasitic infection due to community based treatment with anti-parasite medication.

f) Increased nutrient absorption due to lower prevalence of infection due to anti-parasite treatment (e.g., hook worm).

g) Decreased prevalence of endemic goiter due to increased consumption of iodine (iodized salt).

2. Indirect Impact

a) Satisfaction obtained by mother when it is indicated that child's nutritional status has demonstrated measured positive change (usage of Gomez weight chart.)

b) Satisfaction gained by mother regarding decreased infant malnutrition associated with improved breast feeding practices, better use of weaning foods, etc.

c) Satisfaction and confidence gained by mother from knowing how to prepare nutritious meals for the family (from information transmitted by mass media, mobile demonstration unit, health center visits, health educator and anthropometrist's tapes.)

d) Satisfaction of the mother derived from having more food to prepare/distribute intra-family due to increased food supply (patio crops, fish ponds community gardens, etc.)

e) Decreased risk of cretinism in female offspring of parent with endemic goiter due to iodized salt.

PART FIVE - PROGRAM ADMINISTRATION

A. Borrower Arrangements

GON organizational arrangements for executing the nutrition improvement program are discussed above in the component descriptions of Section C, Part III. Annex II I illustrates the Coordination and Execution Mechanism for the National Food and Nutrition Program (NFNP), including the central roles of i) the Inter-ministerial Commission (CIPAN) and ii) the Technical Committee for Food and Nutrition (CTAN).

1. CIPAN. Presided by the Minister of Health and further consisting of the Ministers of Agriculture, Education, Economy and Director of the National Planning Office, the CIPAN will be responsible for overall program guidance and policy direction. CIPAN members are the executive directors (or board members) of operating (or autonomous) agencies that will be primarily responsible for implementing the NFNP, e.g., PRACS, PLANSAR, INVIERNO, INTA, MOE, etc.

2. CTAN. The Director of the CTAN is Executive Secretary of CIPAN, which will meet periodically throughout the program period to review progress, the need for program modifications and so forth. CTAN is the nutrition planning, evaluating and (in selected instances) implementing arm* of the CIPAN for the NFNP. Annex V A contains an organizational chart of CTAN. In addition to full-time members, the CTAN is comprised of part-time representatives from the operating agencies. The Financial Analysis Section of Part III includes a review of CTAN staffing levels and requirements as well as of associated recurring costs.

3. Operating Agencies. As mentioned, program operating agencies are discussed component-by-component in Part Three. For instance, see Figure 2 (Page 36) for a diagram of nutrition education delivery institutions under Component One. Maximum utilization will be made of current institutional arrangements, e.g., PRACS, PLANSAR, INVIERNO, INTA, MOE and others. See Figure Three (page 101) for a schematic diagram of these nutrition benefit transmission mechanisms.

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* For example, CTAN will have implementing responsibility for the NEDS (especially its mass media element) under Component One and for the NEIS under Component Four.

B. A.I.D. Arrangements

1. USAID Program Management. Mission management of the nutrition improvement program will be carried out through a Program Committee structure consisting of full-time representatives from the Health, Family Planning and Nutrition Division, Capital Development Office, Controller Office and, due to the program's multi-sectoral nature, part-time representatives from the Rural Development Division and the Human Resources Division. The Program Manager will be the USAID's Nutrition Advisor.* It is expected that AID/W will actively backstop program operations, especially with respect to the timely arrangement of technical advisors when necessary at the Washington level.

2. Disbursement Procedures. It is expected that dollar disbursements (for non-CACM, code 941 items) from the loan will be made through direct reimbursement authorizations (DRAs), although the Letter of Commitment procedure may be utilized as appropriate. Unless other suitable procedures surface, project implementation orders (PIOs) will be utilized for dollar obligations from the grant amendment-extension.

Disbursements for local currency costs will be made on a reimbursement basis under local currency DRAs. It is expected that the CIPAN, through the Ministry of Finance, will establish a revolving fund in a numbered Central Bank account for program expenditures.

3. Procurement Procedures. Loan-financed goods and services will have their source and origin in Code 941 countries, including the CACM. Items of Code 935 source and origin may be financed on an off-the-shelf basis in accordance with current guidelines. With respect to the procurement (loan or grant) of technical services, it is expected that the CIPAN/CTAN/operating agencies will give preference to consultants with successful prior work experience in Nicaragua.

C. Implementation Plan

Timetables for the program components are contained in the descriptions of Part III above and supporting annexes. General program events and dates are envisioned

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* Now under a personal services contract, the USAID expects to pick up this individual on a direct hire basis.

as follows.

	Event	Date
i)	Loan Authorized	8-31-77
ii)	Grant Project Agreement Signed	9-30-77
iii)	Loan Agreement Signed	10-31-77
iv)	Grant-funded Services Begin	11-30-77
v)	Initial CPs to Loan Disbursement Met	1-31-78
vi)	First Loan Disbursement for Program	3-31-78
vii)	Special CPs to Loan Disbursement Met	4-30-78
viii)	First Evaluation of Program Completed	11-30-78
ix)	Second Evaluation of Program Completed	11-30-78
x)	Third Evaluation of Program Completed	11-30-79
xi)	Terminal Date for Requesting Disbursement	12-31-80
xii)	Fourth Evaluation of Program Completed	1-31-81

D. Program Evaluation

Evaluation activity under Component Four will provide CTAN, CIPAN and implementing agencies with continuous guidance on program progress and effectiveness of the various interventions. That Component will not, however, evaluate progress of activities outside of the coverage of the NEIS, such as functioning of CIPAN and CTAN, improvements in food distribution and marketing, etc. Therefore, the program requires an overall evaluation program of which the NEIS is the principal ingredient but which encompasses the total program.

A detailed, overall plan will be prepared by the time of initial loan disbursements, based on the progress indicators proposed in each Component. CTAN will be responsible for this global evaluation plan. It will take into account and incorporate the various special evaluation activities proposed in each component and coordinate their execution so as to complement each other and produce an overall evaluation system for the total program, useful to the planning purposes of CIPAN.

E. Conditions and Covenants. See draft Program Authorization in Annex I D.

Department of State
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American Embassy Managua

TELEGRAM

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E.O. 11652: N/A

TAGS:

SUBJECT: DAEC REVIEW OF NUTRITION SECTOR ASSESSMENT AND NUTRITION PROGRAM DEVELOPMENT GRANT

1. THE DAEC APPROVED SUBJECT SECTOR ASSESSMENT AND GRANT PROJECT PAPER ON JUNE 4, 1976.

2. T;E DAEC PROPOSED THE FOLLO'ING POINTS FOR CLARIFICATION OF THE PP: A) MASS MEDIA PROJECT: THE MISSION WAS ADVISED TO AMPLIFY PARAGRAPH 4, PAGE 20 TO STATE MORE EXPLICITLY T'E PROJECT PURPOSE AND EXPECTED OUTPUT, I.E., TO DESIGN AND TEST ALTERNATIVE NUTRITION TOPICS AND RADIO TECHNIQUES TO OBTAIN THE MOST ECONOMICAL AND EFFECTIVE MIX OF RADIO INTERVENTIONS TO SUPPORT ONGOING AND PLANNED PUBLIC SECTOR NUTRITION ACTIVITIES; B) FY 77 LOAN: T'E DAEC CONCLUDED THAT SUBMISSION OF THE NUTRITION LOAN SHOULD FOLLOW THE FORMAL GRANT PROJECT EVALUATION SCHEDULED FOR MAY, 1977 IN ORDER TO PERMIT DETERMINATION OF GON INSTITUTIONAL CAPABILITY AND LEVEL OF COMMITMENT BASED ON STATUS OF PROJECT OUTPUTS, PARTICULARLY NATIONAL FOOD AND NUTRITION POLICY, SURVEILLANCE SYSTEM, PLANNING/COORDINATING/EVALUATION MECHANISM.
THESE CHANGES HAVE BEEN MADE IN THE PROJECT PAPER.

3. IN VIEW OF THE DAEC'S CONCERN OVER PREVIOUS LOW LEVEL OF GON SUPPORT OF NUTRITION ACTIVITIES, MISSION IS ADVISED TO MONITOR CLOSELY GON COUNTERPART CONTRIBUTION TO THE PROJECT AND TO KEEP AID/W INFORMED. RESULTS OF FIRST MISSION EVALUATION IN NOVEMBER, I.E., EXAMINATION OF NATIONAL FOOD AND NUTRITION POLICY AND GON FY 1977 BUDGET SHOULD BE RELAYED TO AID/W IN CABLED SPECIAL REPORT. REPORT SHOULD ALSO ADVISE LATEST GON THINKING REGARDING CONTINUATION OF SUPPLEMENTAL FEEDING PROGRAMS BEGUN UNDER TITLE II WHICH MAY APPEAR TO HAVE MERIT AS PART OF EMERGING NUTRITION STRATEGY.

4. USAID IS ADVISED TO CONSULT WITH TA/NUTRITION REGARDING APPLICABILITY AND TIMELINESS OF TA/N FUNDED PROJECTS TO OBJECTIVES OF THIS PROJECT.

Department of State TELEGRAM

ANNEX I A

ACTION: AID-6
INFO:
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Classification

CONTROL: 325

APR 15, 1975

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AIDAC

E.O. 11652: N/A
SUBJECT: DAEC REVIEW - IRR AND PPP - NUTRITION IMPROVEMENT LOAN

1. ON THE BASIS OF THE DAEC'S REVIEW, THE SUBJECT IRR AND PPP WERE APPROVED. LOAN INTENSIVE REVIEW AND PROP PREPARATION MAY PROCEED SUBJECT TO THE FOLLOWING GUIDANCE.

2. PLANNING/COORDINATION: AN ANALYSIS WILL BE REQUIRED OF THE GON CAPABILITY TO PLAN AND COORDINATE THE SEVERAL ON-GOING AND PROPOSED A.I.D. LOAN PROJECTS. THIS ANALYSIS SHOULD INCLUDE A DISCUSSION OF THE OVERALL RELATION AMONG GON PLANNING ORGANIZATIONS AT DIFFERENT LEVELS: E.G., GON CENTRAL PLANNING DEPARTMENT; SECTORAL PLANNING GROUPS SUCH AS UNASEC; AND INTERNAL PLANNING STAFFS OF AGENCIES.

3. PRIORITY OF PROJECT/ABSORPTIVE CAPACITY: THE CAP SHOULD ANALYZE THE RELATIVE PRIORITY ACCORDED BY THE GON TO THIS PROJECT, VIS-A-VIS OTHER RECONSTRUCTION AND/OR DEVELOPMENT ACTIVITIES, INCLUDING PROPOSED A.I.D. LOAN FUNDED PROGRAMS IN EDUCATION AND HEALTH. THE CAP SHOULD INCLUDE AN ANALYSIS OF HOST COUNTRY HUMAN AND INSTITUTIONAL ABSORPTIVE CAPACITY CONSTRAINTS AND THE MEANS PROPOSED, INCLUDING POSSIBLE DEFERRAL OF LOWER PRIORITY PROGRAMS, TO OVERCOME THESE CONSTRAINTS.

4. ECONOMIC ANALYSIS: A FULL MACRO-ECONOMIC ANALYSIS RELATED TO OVERALL GON PRIORITIES WILL BE REQUIRED IN ORDER TO DEMONSTRATE THE FINANCIAL CAPACITY OF THE GON EITHER TO PROCEED WITH ALL SUCH ACTIVITIES DURING THE PROPOSED TIME SPAN OR TO CHOOSE CERTAIN OF THEM FOR PRIORITY IMPLEMENTATION, WHILE DEFERRING OTHERS.

5. TIME PHASING OF THE PROGRAM: DETERMINATION SHOULD BE MADE DURING THE EARLY STAGES OF INTENSIVE REVIEW, AND THE CONCLUSIONS PRESENTED IN THE PROP, OF THE DEGREE TO WHICH PROPER TIME PHASING OF THE PROGRAM WILL BE DEPENDENT UPON IQC GRANT FUNDED ASPECTS; AND WHETHER PROGRAMMED GRANT FINANCING MIGHT BE REDUCED BY LENGTHENING THE IMPLEMENTATION PERIOD OF THE LOAN TO FOUR OR FIVE YEARS. TO THE DEGREE THAT A PORTION OF THE PROGRAM IS TO BE GRANT FUNDED, THAT PORTION SHOULD BE STRUCTURED TOWARD UPDATING DATA AND STRATEGY AND IMPLEMENTING THE MOST TIME-CRITICAL AND LONGEST LEAD-TIME TRAINING AND INSTITUTIONAL DEVELOPMENT ASPECTS OF THE PROGRAM; ALL OPERATIONAL ACTIVITIES AS WELL AS FOLLOW-ONTECHNICAL ASSISTANCE SHOULD BE CARRIED OUT UNDERTHE LOAN.

6. INSTITUTIONAL CONSIDERATIONS: THE CAP, UTILIZING THE ASSESSMENT FINDINGS, SHOULD JUSTIFY AND DESCRIBE IN DETAIL THE INSTITUTIONAL STRUCTURE WHICH WILL UNDERTAKE INTERSECTORAL PLANNING, COORDINATION AND IMPLEMENTATION FUNCTIONS FOR NUTRITION PROGRAMS. THE ASSESSMENT SHOULD EVALUATE THE CAPABILITY OF VARIOUS INSTITUTIONS WHICH MIGHT BE ABLE, WITH APPROPRIATE TECHNICAL ASSISTANCE, TO PERFORM SUCH TASKS. THE REQUIRED INSTITUTIONAL CAPABILITY ALSO INCLUDES THE ABILITY TO ANALYZE, IN TERMS OF THEIR COSTS AND EFFECTIVENESS, AND TO IMPLEMENT COMPLEMENTARY OR ALTERNATIVE NUTRITION PROGRAMS: E.G., NUTRITION EDUCATION, FOOD FORTIFICATION, RESEARCH, AND SUPPLEMENTARY FEEDING; AS WELL AS THE CAPABILITY FOR ANALYSIS AND UTILIZATION OF THE RESULTS OF THE TAB MASS-MEDIA EDUCATION PROGRAM.

7. TARGET GROUP: THE TARGET GROUP SHOULD BE DEFINED IN THE CAP, UTILIZING THE FINDINGS OF THE NUTRITION ASSESSMENT. SUCH CONSIDERATIONS AS PROTEIN AND CALORIC REQUIREMENTS OF BOTH URBAN AND RURAL POOR, SPECIAL NUTRITION REQUIREMENTS OF PREGNANT AND LACTATING WOMEN AND INFANTS AND SMALLCHILDREN, SOCIAL PATTERNS AFFECTING NUTRITION, INCOME LEVELS, ETC. ARE TO BE ANALYZED DURING THE ASSESSMENT PROCESS.

8. CREDIT FUND: AN ANALYSIS WILL BE REQUIRED OF WHETHER THE PROPOSED CREDIT FUND, STANDING ALONE OR IN CONJUNCTION WITH SUCH OTHER MECHANISMS AS TAX INCENTIVES OR MANDATORY LEGISLATION, CAN MAKE A COST-EFFECTIVE CONTRIBUTION TO THE GOAL OF CAUSING FOOD PROCESSORS TO IMPROVE THE NUTRITIONAL VALUE OF THEIR PRODUCTS AT PRICES AFFORDABLE BY LOW INCOME GROUPS OR WHETHER, EVEN IN THE ABSENCE OF THE CREDIT FUND, MARKET FACTORS AND/OR THE ABOVE CITED OTHER MECHANISMS COULD SATISFACTORILY ATTAIN THESE GOALS.

9. NUTRITION ASSESSMENT AND STRATEGY: IT WILL BE NECESSARY TO CONDUCT A NUTRITION ASSESSMENT IN ORDER TO

DEVELOP A NATIONAL NUTRITION STRATEGY, INCLUDING THE DEFINITION OF NUTRITION GOALS, IDENTIFICATION OF TARGET GROUP BASED ON NUTRITIONAL STATUS, AND ANALYSIS OF VARIOUS POSSIBLE NUTRITION PROGRAMS TO DETERMINE THOSE THAT ARE MOST COST EFFECTIVE IN AMELIORATING MALNUTRITION. IN THE COURSE OF THE HEALTH SECTOR ASSESSMENT, THE DEGREE AND EXTENT OF MALNUTRITION WILL BE ANALYZED, UTILIZING NUTRITION SURVEY DATA. THE NUTRITION ASSESSMENT SHOULD THEN ANALYZE THE FOOD SUPPLY SYSTEM, UTILIZING PRODUCTION AND CONSUMPTION DATA FROM THE AGRICULTURE ASSESSMENT, EXAMINE ALTERNATIVE INTERVENTIONS AND DETERMINE WHICH WOULD HAVE THE MOST COST-EFFECTIVE NUTRITIONAL IMPACT ON THE TARGET GROUP. SUFFICIENT ATTENTION IS TO BE GIVEN IN THE HEALTH SECTOR ASSESSMENT TO ENVIRONMENTAL SANITATION AND NUTRITIONALLY RELATED HEALTH SERVICES TO ENABLE DETERMINATION OF INTERSECTORAL PROGRAM PRIORITIES. T.A. AND TRAINING NEEDS TO DEVELOP AN INTERSECTORAL PLANNING AND COORDINATING CAPACITY WITHIN THE GON SHOULD BE IDENTIFIED IN THE ASSESSMENT.

A. A TDY TEAM WILL BE PROPOSED SEPTEL TO ASSIST THE MISSION/GON IN DEVELOPING A SCOPE OF WORK FOR THE ASSESSMENT, WHICH SHOULD BE SUBMITTED FOR BUREAU APPROVAL. THE ASSESSMENT ITSELF SHOULD OF COURSE BE SUBMITTED AND REVIEWED BY AID/W WELL BEFORE SUBMISSION OF THE CAP.

10. REPLICABILITY OF PROGRAMS: THE CAP SHOULD PRESENT AN ANALYSIS OF THE DEGREE TO WHICH THE TARGET GROUP CAN BE REACHED BY THE PROGRAM ITSELF OR BY LATER EXTENSIONS WHICH ARE WITHIN GON CAPACITY TO FINANCE AND ADMINISTER.

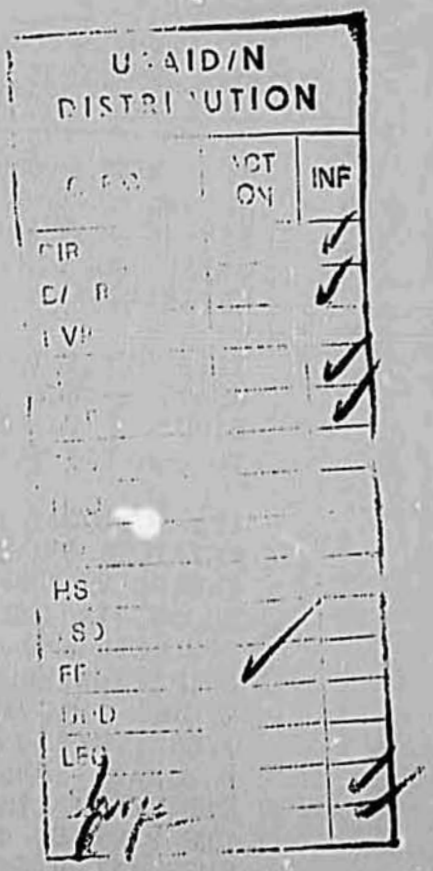
11. UTILIZING EXPERIENCE IN OTHER L.A. NUTRITION PROGRAMS: USAID SHOULD ENSURE THAT INTENSIVE REVIEW INVOLVES STUDY OF OTHER L.A. COUNTRIES' NUTRITION PROGRAMS IN ORDER TO BENEFIT FROM THEIR EXPERIENCE.

12. PROGRAM DESIGN AND EVALUATION: DEVELOPMENT OF THE DETAILED PROGRAM DESIGN AND EVALUATION PLANDURING INTENSIVE REVIEW SHOULD: FIRST, BE PREMISED ON THE NEED TO OBTAIN AND UTILIZE THE MAXIMUM FEASIBLE DEGREE OF CONCRETE AND QUANTIFIED INFORMATION CONCERNING EXISTING NUTRITION-RELATED CONDITIONS, I.E., BASELINE INFORMATION; SECOND, PROVIDE FOR SETTING FORTH AND QUANTIFYING TO THE DEGREE REASONABLY POSSIBLE THE PROJECTED RESULTS OF THE PROGRAM, IMMEDIATEAND LONGER TERM; ALONG WITH THEIR ESTIMATED TIMING; AND THIRD, INCLUDE INTERIM TARGETS FOR THE PURPOSE OF EVALUATING ONGOING PROGRAM PROGRESS. WHATEVER TECHNICAL ASSISTANCE MAY BE NEEDED T' MEET THIS REQUIREMENT SHOULD BE INCLUDED IN THE PROJECT.

13. LOCAL LEVEL COORDINATION AND THE ROLE OF THE NUTRITION

PROMOTERS: THE CAP SHOULD DISCUSS THE ROLE OF THE PROPOSED NUTRITION PROMOTERS AND PROPOSED MECHANISMS FOR PROMOTING COORDINATION ON THE LOCAL LEVEL WITH COMMUNITY ORGANIZATIONS AND PERSONNEL DEALING WITH CONCURRENT HEALTH, EDUCATION, AND AGRICULTURAL PROJECTS.

14. ROLE OF WOMEN: AS REQUIRED BY THE FAA, THE CAP SHOULD ANALYZE THE ROLE OF WOMEN AS AGENTS AND AS BENEFICIARIES OF THE PROJECT AND DESCRIBE HOW THIS PROJECT PARTICIPATION WILL IMPROVE THEIR INVOLVEMENT IN THE DEVELOPMENT PROCESS. THIS DESCRIPTION SHOULD NOT BE LIMITED TO AN IMPACT STATEMENT, BUT SHOULD DEMONSTRATE THE WAYS IN WHICH SUCH PARTICIPATION WILL TAKE PLACE. THE ANALYSIS SHOULD PAY PARTICULAR ATTENTION TOTHE SPECIAL ROLE OF WOMEN IN THIS AREA AS FOOD PURCHASERS AND PREPARERS, AS WELL AS TO THE DIFFERENT FEEDING PATTERNS AND LEVELS OF MALNUTRITION BETWEEN MALES AND FEMALES. KISSINGER



A. GENERAL CRITERIA FOR COUNTRY

1. FAA Sec. 116. Can it be demonstrated that contemplated assistance will directly benefit the needy? If not, has the Department of State determined that this government has engaged in consistent pattern of gross violations of internationally recognized human rights?	**Yes. This project will directly benefit the poor by improving their health through increasing their nutritional well-being.**
2. FAA Sec. 481. Has it been determined that the government of recipient country has failed to take adequate steps to prevent narcotics drugs and other controlled substances (as defined by the Comprehensive Drug Abuse Prevention and Control Act of 1970) produced or processed, in whole or in part, in such country, or transported through such country, from being sold illegally within the jurisdiction of such country to U.S. Government personnel or their dependents, or from entering the U.S. unlawfully?	No. It has not been so determined.
3. FAA Sec. 620(a). Does recipient country furnish assistance to Cuba or fail to take appropriate steps to prevent ships or aircraft under its flag from carrying cargoes to or from Cuba?	No. It does not furnish such assistance.
4. FAA Sec. 620(b). If assistance is to a Government, has the Secretary of State determined that it is not controlled by the international Communist movement?	Yes. The Secretary of State has so determined.
5. FAA Sec. 620(c). If assistance is to government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) debt is not denied or contested by such government?	No. The Government of Nicaragua is not so liable.

6. FAA Sec. 620(c)(1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities?	No. The Government of Nicaragua has taken no such action.
7. FAA Sec. 620(f); App. Sec. 108. Is recipient country a Communist country? Will assistance be provided to the Democratic Republic of Vietnam (North Vietnam), South Vietnam, Cambodia or Laos?	No. Nicaragua is not a communist country nor is it helping Vietnam, Cambodia or Laos.
8. FAA Sec. 620(i). is recipient country in any way involved in (a) subversion of, or military aggression against, the United States or any country receiving U.S. assistance, or (b) the planning of such subversion or aggression?	No. Nicaragua is not subverting the United States.
9. FAA Sec. 620(j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction, by mob action, of U.S. property?	No. Nicaragua has not failed to take such measures.
10. FAA Sec. 620(l). If the country has failed to institute the investment guaranty program for the specific risks of expropriation, inconvertibility or confiscation, has the AID Administrator within the past year considered denying assistance to such government for this reason?	The Investment Guarantee Program exists in Nicaragua.
11. FAA Sec. 620(o); Fishermen's Protective Act, Sec. 5. If country has seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters,	Nicaragua has not taken any actior against U.S. fishing activities.
a. has any deduction required by Fishermen's Protective Act been made?	No deduction is required.
b. has complete denial of assistance been considered by AID Administrator?	Denial of assistance has not been considered.

12.	FAA Sec. 620(q); App. Sec. 504. (a) Is the government of the recipient country in default on interest or principal of any AID loan to the country? (b) Is country in default exceeding one year on interest or principal on U.S. loan under program for which App. Act appropriates funds, unless debt was earlier disputed, or appropriate steps taken to cure default?	Nicaragua is in default on AID Loan 017 for $18,592.50 since May 1977.
13.	FAA Sec. 620(s). What percentage of country budget is for military expenditures? How much of foreign exchange resources spent on military equipment? How much spent for the purchase of sophisticated weapons systems? (Consideration of these points is to be coordinated with the Bureau for Program and Policy Coordination, Regional Coordinators and Military Assistance Staff (PPC/RC).)	Defense expenditures for 1977 are 10.7% of the total national budget. Approximately .2 % of foreign exchange resources are spent on military equipment. None is spent on the purchase of sophisticated weapons systems.
14.	FAA Sec. 620(t). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption?	No. Nicaragua has full diplomatic relations with the United States.
15.	FAA Sec. 620(u). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the AID Administrator in determining the current AID Operational Year Budget?	Nicaragua is not delinquent in the payment of its U.N. obligations.
16.	FAA Sec. 620A. Has the country granted sanctuary from prosecution to any individual or group which has committed an act of international terrorism?	Nicaragua has not granted sanctuary to any terrorist group.
17.	FAA Sec. 666. Does the country object, on basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. there to carry out economic development program under FAA?	Nicaragua does not so object to any U.S. assistance officer.
18.	FAA Sec. 669. Has the country delivered or received nuclear reprocessing or enrichment equipment, materials or technology, without specified arrangements on safeguards, etc.?	Nicaragua has no nuclear equipment.

19. FAA Sec. 620. Has the country denied its citizens the right or opportunity to emigrate?	Nicaragua has not denied its citizens the right to emigrate.

B. FURTHER CRITERIA FOR COUNTRY

1. Development Assistance Country Criteria

a. FAA Sec. 102(c),(d). Have criteria been established, and taken into account, to assess commitment and progress of country in effectively involving the poor in development, on such indexes as: (1) small-farm labor intensive agriculture, (2) reduced infant mortality, (3) population growth, (4) equality of income distribution, and (5) unemployment.	All AID assisted projects include criteria for assessing the degree to which Nicaragua is increasing the involvement of the poor in development activities.
b. FAA Sec. 201(b)(5),(7)&(8); Sec. 203; 281(a)(1),(7). Describe extent to which country is:	
(1) Making appropriate efforts to increase food production and improve means for food storage and distribution.	Nicaragua is encouraging increased agricultural production, particularly among small farmers.
(2) Creating a favorable climate for foreign and domestic private enterprise and investment.	Private enterprise both foreign and domestic is encouraged in Nicaragua.
(3) Increasing the public's role in the developmental process.	This project will encourage the wider involvement of local citizens in the developmental process at the rural village level.
(4) (a) Allocating available budgetary resources to development.	Budget resources for development, especially in the agricultural sector have increased significantly in recent years.
(b) Diverting such resources for unnecessary military expenditure and intervention in affairs of other free and independent nations.	Nicaragua is not making unnecessary military expenditures.
(5) Making economic, social, and political reforms such as tax collection improvements and changes in land tenure arrangements, and making progress toward respect for the rule of law, freedom of expression and of the press, and recognizing the importance of individual freedom, initiative, and private enterprise.	Nicaragua is improving tax collection procedures and is studying land reform measures. Although martial law continues there has been a relaxation of restrictions. Private enterprise is recognized and given strong encouragement.

(6) Otherwise responding to the vital economic, political, and social concerns of its people, and demonstrating a clear determination to take effective self-help measures.	Nicaragua's major effort in integrated rural development reflects a clear policy determination to improve the socio-economic status of the rural poor.
c. FAA Sec. 201(b), 211(a). Is the country among the 20 countries in which development assistance loans may be made in this fiscal year, or among the 40 in which development assistance grants (other than for self-help projects) may be made?	Nicaragua is among the countries in which development loans may be made.
d. FAA Sec. 115. Will country be furnished, in same fiscal year, either security supporting assistance, or Middle East peace funds? If so, is assistance for population programs, humanitarian and through international organizations, or regional programs?	Nicaragua will receive no supporting assistance this year.
2. Security Supporting Assistance Country Criteria	
a. FAA Sec. 502B. Has the country engaged in a consistent pattern of gross violations of internationally recognized human rights? Is program in accordance with policy of this Section?	No.
b. FAA Sec. 531. Is the Assistance to be furnished to a friendly country, organization, or body eligible to receive assistance?	Yes.
c. FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made?	Not applicable.

II. 6C(2) - PROJECT CHECKLIST

Listed below are, first, statutory criteria applicable generally to projects with FAA funds, and then project criteria applicable to individual fund sources: Development Assistance (with a sub-category for criteria applicable only to loans); and Security Supporting Assistance funds.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE? IDENTIFY. HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PROJECT?

GENERAL CRITERIA FOR PROJECT.

1. App. Unnumbered; FAA Sec. 653(b)

   (a) Describe how Committees on Appropriations of Senate and House have been or will be notified concerning the project; (b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than $1 million over that figure plus 10%)?

   A description of this project was shown on page 225 of the FY 77 Congressional Presentation.

2. FAA Sec. 611(a)(1). Prior to obligation in excess of $100,000, will there be (a) engineering, financial, and other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?

   Plans and cost estimates have been made and provide firm estimate of cost to U. S.

3. FAA Sec. 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?

   Reglamento for enforcement of salt iodization law has been prepared (See Annex III B) and will be published in Gazeta Oficial as a CP to Disbursement.

4. FAA Sec. 611(b); App. Sec. 101. If for water or water-related land resource construction, has project met the standards and criteria as per Memorandum of the President dated Sept. 5, 1973 (replaces Memorandum of May 15, 1962; see Fed. Register, Vol 38, No. 174, Part III, Sept. 10, 1973)?

   Not Applicable.

5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed $1 million, has Mission Director certified the country's capability effectively to maintain and utilize the project?

   The Director has so certified. (See Annex I C).

6. FAA Sec. 209, 619. Is project susceptible of execution as part of regional or multilateral project? If so why is project not so executed? Information and conclusion whether assistance will encourage regional development programs. If assistance is for newly independent country, is it furnished through multilateral organizations or plans to the maximum extent appropriate?

No. However, the Nutrition Institute for Central America and Panama (INCAP) has assisted in its development and will further assist in its implementation.

7. FAA Sec. 601(a); (and Sec. 201(f) for development loans). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.

Healthier, better nourished people are more competitive and will generate more efficient activity in industry, agriculture, and commerce as well as will be more prone to working together to form mutual assistance organizations such as cooperatives.

8. FAA Sec. 601(b). Information and conclusion on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).

Substantial goods and technical services will be purchased from the United States.

9. FAA Sec. 612(b); Sec. 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized to meet the cost of contractual and other services.

The Government of Nicaragua's contribution substantially exceeds the minimum required contribution to the program.

10. FAA Sec. 612(d). Does the U.S. own excess foreign currency and, if so, what arrangements have been made for its release?

Not Applicable.

FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

a. FAA Sec. 102(c); Sec. 111; Sec. 281a. Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production, spreading investment out from cities to small towns and rural areas; and (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions?

The Program will provide the rural poor with opportunities to improve their health through improved nutrition which will in turn permit them to participate more actively in the local economy and contribute to the growth of local governmental programs.

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b. FAA Sec. 103, 103A, 104, 105, 106, 107. Is assistance being made available: [include only applicable paragraph -- e.g., a, b, etc. -- which corresponds to source of funds used. If more than one fund source is used for project, include relevant paragraph for each fund source.]

(1) [103] for agriculture, rural development or nutrition; if so, extent to which activity is specifically designed to increase productivity and income of rural poor; [103A] if for agricultural research, is full account taken of needs of small farmers;

The target group is the malnourished, including mothers and children up to the age of 5 within the poor rural communities in the poorest region of Nicaragua. It is assumed that a healthier rural poor will have a greater potential for self improvement.

(2) [104] for population planning or health; if so, extent to which activity extends low-cost, integrated delivery systems to provide health and family planning services, especially to rural areas and poor;

Not applicable.

(3) [105] for education, public administration, or human resources development; if so, extent to which activity strengthens nonformal education, makes formal education more relevant, especially for rural families and urban poor, or strengthens management capability of institutions enabling the poor to participate in development;

This Nutrition Project is coordinated with and strengthens AID's Educational Loan for both the formal and non-formal education of the poor.

(4) [106] for technical assistance, energy, research, reconstruction, and selected development problems; if so, extent activity is:

Not applicable.

(a) technical cooperation and development, especially with U.S. private and voluntary, or regional and international development, organizations;

Yes, selected nutrition research activities are expected to be carried out by U. S. consultants.

(b) to help alleviate energy problem;

Not applicable.

(c) research into, and evaluation of, economic development processes and techniques;

Not applicable.

(d) reconstruction after natural or manmade disaster;

Not applicable.

(e) for special development problem, and to enable proper utilization of earlier U.S. infrastructure, etc., assistance;

Not applicable.

(f) for programs of urban development, especially small labor-intensive enterprises, marketing systems, and financial or other institutions to help urban poor participate in economic and social development.

Not applicable.

(5) [107] by grants for coordinated private effort to develop and disseminate intermediate technologies appropriate for developing countries.

Not applicable.

c. FAA Sec. 110(a); Sec. 208(e). Is the recipient country willing to contribute funds to the project, and in what manner has or will it provide assurances that it will provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or has the latter cost-sharing requirement been waived for a "relatively least-developed" country)?

The Government of Nicaragua has indicated its willingness to finance 55 % of the total cost of the program.

d. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing?

The Grant portion of this project will be disbursed over 4 years.

e. FAA Sec. 207; Sec. 113. Extent to which assistance reflects appropriate emphasis on; (1) encouraging development of democratic, economic, political, and social institutions; (2) self-help in meeting the country's food needs; (3) improving availability of trained worker-power in the country; (4) programs designed to meet the country's health needs; (5) other important areas of economic, political, and social development, including industry; free labor unions, cooperatives, and Voluntary Agencies; transportation and communication; planning and public administration; urban development, and modernization of existing laws; or (6) integrating women into the recipient country's national economy.

The program supports extensive, locally initiated efforts to develop community self-help and human resource development through improving health conditions of the rural poor and improving food utilization via nutrition education for women and children.

f. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civic education and training in skills required for effective participation in governmental and political processes essential to self-government.

Through use of self help efforts of cummunity level committees, the program recognizes the effective contribution which the rural population can make to the program.

g. FAA Sec. 201(b)(2)-(4) and -(8); Sec. 201(e); Sec. 211(a)(1)-(3) and -(8). Does the activity give reasonable promise of contributing to the development: of economic resources, or to the increase of productive capacities and self-sustaining economic growth; or of educational or other institutions directed toward social progress? Is it related to and consistent with other development activities, and will it contribute to realizable long-range objectives? And does project paper provide information and conclusion on an activity's economic and technical soundness?

This proposed project plans to fulfill the promise. This project is one of many proposed or already on-going AID Loans in an integrated rural development effort. The project paper provides documentation on the economic and technical soundness of this proposal.

h. FAA Sec. 201(b)(6); Sec. 211(a)(5), (6). Information and conclusion on possible effects of the assistance on U.S. economy, with special reference to areas of substantial labor surplus, and extent to which U.S. commodities and assistance are furnished in a manner consistent with improving or safeguarding the U.S. balance-of-payments position.

The program will provide for the procurement of technical services and some commodities in the U. S.

2. Development Assistance Project Criteria (Loans only)

a. FAA Sec. 201(b)(1). Information and conclusion on availability of financing from other free-world sources, including private sources within U.S.

By its nature the Program requires long-term concessional financing, and other sources of such financing are not available at this time.

b. FAA Sec. 201(b)(2); 201(d). Information and conclusion on (1) capacity of the country to repay the loan, including reasonableness of repayment prospects, and (2) reasonableness and legality (under laws of country and U.S.) of lending and relending terms of the loan.

Prospects for loan repayment are reasonable (see USAID's DAP). This Loan is legal under U. S. and Nicaraguan law. A C. P. will require such certification.

c. FAA Sec. 201(e). If loan is not made pursuant to a multilateral plan, and the amount of the loan exceeds $100,000, has country submitted to AID an application for such funds together with assurances to indicate that funds will be used in an economically and technically sound manner?

Yes. (See Annex I E).

d. FAA Sec. 201(f). Does project paper describe how project will promote the country's economic development taking into account the country's human and material resources requirements and relationship between ultimate objectives of the project and overall economic development?

The Project paper provided such a description.

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e. FAA Sec. 202(a). Total amount of money under loan which is going directly to private enterprise, is going to intermediate credit institutions or other borrowers for use by private enterprise, is being used to finance imports from private sources, or is otherwise being used to finance procurements from private sources?

Not applicable.

f. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete in the U.S. with U.S. enterprise, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan?

No such enterprise is being assisted.

3. Project Criteria Solely for Security Supporting Assistance

FAA Sec. 531. How will this assistance support promote economic or political stability?

Healthier, better nourished people can participate more effectively in both the fields of economics and politics.

4. Additional Criteria for Alliance for Progress

[Note: Alliance for Progress projects should add the following two items to a project checklist.]

a. FAA Sec. 251(b)(1), -(8). Does assistance take into account principles of the Act of Bogota and the Charter of Punta del Este; and to what extent will the activity contribute to the economic or political integration of Latin America?

The proposed project takes into account both the Act of Bogota and the Charter of Punta del Este. Healthier Nicaraguans will give Nicaragua a better economic base from which it can integrate its contribution to Latin America.

b. FAA Sec. 251(b)(8); 251(h). For loans, has there been taken into account the effort made by recipient nation to repatriate capital invested in other countries by their own citizens? Is loan consistent with the findings and recommendations of the Inter-American Committee for the Alliance for Progress (now "CEPCIES," the Permanent Executive Committee of the OAS) in its annual review of national development activities?

The limited data available about the repatriation of Nicaraguan funds invested abroad has been taken into account as far as possible. The loan is consistent with the most recent CEPCIES findings concerning Nicaragua.

III. 6C(3) - STANDARD ITEM CHECKLIST

Listed below are statutory items which normally will be covered routinely in those provisions of an assistance agreement dealing with its implementation, or covered in the agreement by exclusion (as where certain uses of funds are permitted, but other uses not).

These items are arranged under the general headings of (A) Procurement, (B) Construction, and (C) Other Restrictions.

A. Procurement

1.	FAA Sec. 602. Are there arrangements to permit U.S. small business to participate equitably in the furnishing of goods and services financed?	U.S. small business will be afforded an opportunity to participate equitably in the furnishing of goods and services for the program.
2.	FAA Sec. 604(a). Will all commodity procurement financed be from the U.S. except as otherwise determined by the President or under delegation from him?	Loan-financed commodities will have their source and origin in Code 941 countries, or Nicaragua; grant financed commodities will have their source origin in U.S. or Nicaragua; in accordance with applicable regulations.
3.	FAA Sec. 604(d). If the cooperating country discriminates against U.S. marine insurance companies, will agreement require that marine insurance be placed in the U.S. on commodities financed?	The Agreement will require that marine insurance be placed in accordance with applicable regulation.
4.	FAA Sec. 604(e). If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity?	Not applicable.
5.	FAA Sec. 608(a). Will U.S. Government excess personal property be utilized wherever practicable in lieu of the procurement of new items?	U.S. Government Excess Property will be used when possible.
6.	MMA Sec. 901(b). (a) Compliance with requirement that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S.-flag commercial vessels to the extent that such vessels are available at fair and reasonable rates.	This project will comply within the parameters of the Nicaragua Waiver.
7.	FAA Sec. 621. If technical assistance is financed, will such assistance be furnished to the fullest extent practicable as goods and professional and other services from private enterprise on a contract basis? If the facilities of other Federal agencies will be utilized,	Technical assistance will be purchased from private sources with possible assistance from federal agencies.

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are they particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs?	
8. International Air Transport. Fair Competitive Practices Act, 1974	
If air transportation of persons or property is financed on grant basis, will provision be made that U.S.-flag carriers will be utilized to the extent such service is available?	U.S. flag carriers will be used where possible.
B. Construction	
1. FAA Sec. 601(d). If a capital (e.g., construction) project, are engineering and professional services of U.S. firms and their affiliates to be used to the maximum extent consistent with the national interest?	Not applicable
2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable?	Yes. AID's normal procurement procedure will be followed.
3. FAA Sec. 620(k). If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U.S. not exceed $100 million?	Not applicable.
C. Other Restrictions	
1. FAA Sec. 201(d). If development loan, is interest rate at least 2% per annum during grace period and at least 3% per annum thereafter?	The interest rate will be 2% per annum during grace period and 3% per annum thereafter.
2. FAA Sec. 301(d). If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights?	Not applicable.
3. FAA Sec. 620(h). Do arrangements preclude promoting or assisting the foreign aid projects or activities of Communist-Bloc countries, contrary to the best interests of the U.S.?	They preclude promotion of Communist Block projects.
4. FAA Sec. 636(i). Is financing not permitted to be used, without waiver, for purchase, long-term lease, or exchange of motor vehicle manufactured outside the U.S. or guaranty of such transaction?	Financing for foreign made vehicles is not permitted without waiver.

5. Will arrangements preclude use of financing:	
a. FAA Sec. 114. to pay for performance of abortions or to motivate or coerce persons to practice abortions?	Not applicable.
b. FAA Sec. 620(g). to compensate owners for expropriated nationalized property?	Not applicable.
c. FAA Sec. 660. to finance police training or other law enforcement assistance, except for narcotics programs?	Financing will not be used for either police or law enforcement.
d. FAA Sec. 662. for CIA activities?	CIA activities will not be funded by this loan.
e. App. Sec. 103. to pay pensions, etc., for military personnel?	Military pensions will not be financed.
f. App. Sec. 106. to pay U.N. assessments?	U.N. assessments will not be funded by this loan.
g. App. Sec. 107. to carry out provisions of FAA Sections 209(d) and 251(h)? (transfer to multilateral organization for lending).	Project funds will only be used by stated project activities.
h. App. Sec. 501. to be used for publicity or propaganda purposes within U.S. not authorized by Congress?	Funds will be used for publicity of nutrition event as well as nutritional propaganda. However, no funds will be used for political publicity or propaganda.

CERTIFICATION PURSUANT TO SECTION 611(E) OF THE FOREIGN ASSISTANCE ACT OF 1961, AS AMENDED

I CERTIFY to the Administrator of the Agency for International Development that, to the best of my knowledge and belief, Nicaragua possesses both the financial capability and human resources to maintain and utilize effectively the Nutrition Improvement Program to be undertaken pursuant to the terms of the A.I.D. Loan/Grant proposed in this Paper. This program will be supported by both the United States of America and the Government of Nicaragua and will assist in improving the food habits of, increasing the availability of food to, and extending health services to, disadvantaged Nicaraguans, especially the rural poor. Provision is being made under the program for technical assistance for the program components in order to ensure effective utilization of a development program of this nature. I have also taken into account the maintenance and utilization of projects in Nicaragua previously financed or assisted by the United States - including the current Nutrition Grant Project and the Rural Health Services Program - and the capability of the executing Nicaraguan institutions.

8-10-77
Date

Arthur W. Mudge
Director
A.I.D. Mission to Nicaragua

ANNEX II A

Framework of the Strategy for Integrated Rural Development

Three intrinsic constraints determined the design of the integrated rural development strategy. One is the dispersion of the rural poor. Nicaragua has the largest land area (48,000 sq. miles) in Central America; it also has the lowest population to land ratio (33 per square mile). The second constraint is economic. The financial resources required to reach massive members of rural poor over widely dispersed areas are simply unavailable. Finally, and most importantly, is the unforgiving complexity of the nature of poverty and therefore the design of effective programs to help the poor.

In recognition of the above, the GON postulated the following development premises:

a. It is held that poverty is caused both by a lack of financial means and a set of conditions including, but not limited to deficient education, inadequate nutrition, high morbidity, and inadequate shelter.

b. Given the economic constraints and the complexity of the problem, programs designed to attack poverty must be integrated and complementary in such a way that the outputs of one become inputs for another. It follows that programs designed for short term impact must be valid in the long term.

c. In view of the dispersion of the rural population, program resources should be concentrated first in Regions V and II successively. These two regions contain almost 60% of the target population and are endowed with an abundant, albeit deteriorating, base of natural resources.

ANNEX II B

TABLE No.1

SUMMARY OF NUTRITION STUDIES BASED ON WEIGHT AND AGE MEASUREMENTS
CHILDREN 0-5 YEARS OF AGE, NICARAGUA

Study	Date	Region	Sample Size	Findings - Nutrional Status									
				Total Malnourished		Normal		Mild PCM		Moderate PCM		Severe PCM	
				No.	%	No.	%	No.	%	No.	%	No.	%
INCAP	1966	All Regions	723	409	56.5	314	43.4	303	41.9	95	13.2	11	1.5
Division os Nutrition MOH	1969	Managua II	1500	851	56.7	649	43.4	679	45.3	152	10.1	20	1.3
CARE	1974	VIII (Rural)	156	130	83.3	26	17.0	71	45.5	46	29.5	13	8.3
Nutritionist MOH	1975	I (Rural)	1102	757	68.7	345	31.3	507	46.0	209	18.9	41	3.7
UNAN	1975	I (Rural)	42	26	62.0	16	37.8	16	37.8	8	20.0	2	4.4
Miskito	1975	VII (Rural)	2400	1502	62.5	898	37.0	870	36.0	568	23.0	64	4.0
CTAN*	1977	II, V	875	544	62.2	331	37.8	445	50.8	81	9.3	18	2.1

SOURCE: Unidad de Análisis del Sector Salud, Evaluación del Componente Nutricional dentro del Sector Salud, asesorados por INCAP, Diciembre, 1975

* CTAN Pilot survey, March 1977

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Table No.2

Regions

	Total	I	II	III	IV	V	VI	VII	VIII
Population	2,113,600	344,500	824,900	83,400	145,000	333,500	217,700	70,100	88.500
% of total population	100	16.3	39.0	4.0	6.9	15.8	10.3	3.6	4.1
% rural population	52.2	51.4	26.6	65.5	76.7	77.4	77.4	77.5	76.4
% PCM children under 5 yrs.	56.6	56.5	63.6	63.4	61.4	46.7	42.5	31.8	59.5
% Mortality in children under 5 years	32.3	37.6	31.5	26.4	45.6	25.6	15.4	28.3	30.7
% population with low and deficient plasma levels of Vit.A	9.96	8.09	16.6	4.1	8.4	9.1	5.6	23.1	3.0
% prevalence endemic goiter*	32	32-48	31-42	45	34	22-34	14-34	13	13
% mothers that breast-feed	79	84.2	72.2	83.3	100	91.5	74.6	57.1	73.9
% rural literacy	30.3	34.6	42.2	44.3	25	23.1	23.3	24.1	24.1
% rural pop w/potable water	5.52	5.5	15.3	3.7	1.4	3.8	1.6	1.9	1.9
% rural pop w/water disposal systems	39.1	30.6	45.4	55.9	17.1	19.7	21.7	27.1	27.1

* World Health Organization considers prevalence level above 10% to be a public health problem.

Source: Analisis Preliminar de la situación de salud en Nicaragua
Evaluación del Componente nutricional dentro del Sector Salud
UASS/INCAP - Sept. 1976

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Table 3

% Distribution of Rural Families According to Nutrient Adequacy

	Less than 50% RDA	51-75% RDA	76-100% RDA	100 + % RDA
Calories	2	30	25	43
Protein	2	13	25	60
Retinol (Vit. A)	75	13	6	6
Thiamin	2	16	17	65
Riboflavin	24	33	16	27
Niacin	17	35	25	22
Vit. C	38	10	11	41
Iron	3	8	13	76
Calcium	10	17	10	63

Source: Flores, M., M.T. Menchú y M. A. Guzmán
Evaluación dietética de familias y preescolares mediante la aplicación de diferentes métodos y técnicas - Areas rural de Nicaragua.
Archivos Latinoamericanos de Nutrición,
23 : 325, 1973

ANNEX II C

GON Inputs During Program Development Period

(9-1-76 through 6-30-77)

i)	Salaries of CTAN staff paid from CTAN budget	$ 44,257.00
ii)	Salary support for CTAN staff from other sectors	$ 51,000.00
iii)	Salaries of non-CTAN GON personnel from other sectors	$ 15,285.00
iv)	CTAN non-personnel operating expenses	$ 15,592.00
v)	Materials and supplies	$ 15,557.00
vi)	Office equipment and vehicles	$ 31,000.00
vii)	Miscellaneous	$ 1,478.00
	TOTAL	$174,169.00

ANNEX II D

Terms of Reference for Food Distribution Study

(See USAID Bulk File)

UNCLASSIFIED
ANNEX II E

LIST OF CONTRIBUTING CONSULTANT REPORTS*

PIO/T No.

3-60049 George Poynor, 3 trip reports, including The Nicaraguan National System for Nutritional Surveillance and Information.

3-60062 La Mar Merk, 2 trip reports.

3-60063 TQ Cathy Strachan, Analysis of the Nutrition-Related Programs and Activities of the Ministry of Health.

3-60066 TQ Albert "Scaff" Brown, Nicaragua - A Strategy for Nutrition Interventions in the Small Farm Sector.

Lisbeth G. Christiansen, Evaluation of Field Structure and Programs of Institutions Working in Rural Development in Nicaragua: Recommendations for reinforcement of existing and new activities, and a closer collaboration and coordination between the institutions.

3-60081 TQ Joyce King - Evaluation of Supplementary Feeding Programs in Nicaragua.

3-60082 TQ Jim Theroux - A Plan for Nutrition Education in Nicaragua.

Sylvia Forman - Food Practices of Lower-Income Nicaraguans and Cultural Considerations in Changing Food Practices.

3-60078 TQ Harvey Williams, Possible Nutrition Projects in Open No. 3.

3-60079 TQ Mila Brooks, Study of Day Care Centers as Possible Vehicle for Nutrition Improvement.

3-60066 TQ Tom Cooke - Mass Media Education Design.

By the end of the year:

3-60072 TQ/60084 Clapp & Mayne - Food Distribution Study.

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* Produced under Nutrition Program Development Grant.

POLITICA NACIONAL DE ALIMENTACION Y NUTRICION

CONTENIDO:

ANTECEDENTES:

El diagnóstico de la situación nutricional del país, realizado en 1966 por el Instituto de Nutrición de Centro América y Panamá (INCAP) y finalmente actualizado en 1975 por la Unidad de Análisis del Sector Salud (UASS), conjuntamente con INCAP, señaló que el 56.6% de los niños menores de 5 años padecen Desnutrición Proteico-Calórica en algún grado, causada fundamentalmente por la sub-alimentación; que el 7% de la población rural se ve afectada por las Anemias Nutricionales, principalmente por deficiencias de hierro, lo mismo que el 11% de la población urbana, siendo en ésta última, mayor la prevalencia en mujeres embarazadas, niños menores de 3 años y hombres de 12 a 17 años; y que el 44.7% de la población menor de 14 años sufre de Hipovitaminosis "A", detectando que el problema es mayor a nivel rural, siendo las regiones más afectadas la II, III, IV y V respectivamente, aunque las anemias nutricionales tienen mayor incidencia en las regiones VI y VIII.

Por su parte el Bocio Endémico provocado por la deficiencia de yodo, presenta una prevalencia media de 32% en la población total del país, siendo mayor en mujeres que en hombres. Proyecciones del problema a 1985, considerando como hipótesis la persistencia sin cambios de algunos factores que condicionan la situación y tomando en cuenta las tendencias de la población y su estructura futura, señalan que el problema de la desnutrición no sólo se mantendrá, sino que tiende a agravarse, afectando princi-

palmente el grupo de menores de 4 años que porcentualmente aumentarán más que la población económicamente activa, si no se toman desde ya, todas las medidas necesarias.

2. JUSTIFICACION DE LA PNAN:

El problema que plantea la mal nutrición en Nicaragua, señalado anteriormente es sumamente complejo, se relaciona con varios aspectos de la actividad nacional y afecta un amplio sector de la población.

Las consecuencias de la desnutrición inciden negativamente sobre el desarrollo económico y social del país, el que se ve afectado por la disminución en la capacidad física e intelectual de la población.

La disminución de la capacidad intelectual ocasiona mayores gastos en educación y reduce la eficiencia de los recursos comprometidos en el proceso educativo, obteniéndose consecuentemente resultados poco satisfactorios en relación a los niveles y calidad de la educación de vastos sectores poblacionales. Por otro lado, la capacidad de desarrollar un trabajo productivo sufre no sólo el efecto de los bajos niveles de la educación recibida, sino también el ocasionado por el deterioro de la capacidad física de la persona.

Así mismo, hay que agregar el costo que representa para el Gobierno y el país en general el exceso de morbilidad de la población desnutrida. Consecuentemente, la protección nutricional de la población en edad temprana, contribuirá a aumentar la tasa de rendimiento económico en la edad adulta.

3. CONTEXTO GLOBAL DE LA POLITICA NACIONAL DE ALIMENTACION Y NUTRICION (PNAN)

El Gobierno de la República consciente de la significancia y magnitud del problema nutricional y reconociendo la importancia que constituye una adecuada nutrición en el desarrollo físico e intelectual del individuo, trata de aunar todos los esfuerzos necesarios para encontrar soluciones alternativas al problema, pues si bien es cierto que en su política de Desarrollo Económico y Social hace énfasis en aquellas que tienden hacia el mejoramiento del nivel de vida de la población Nicaraguense, también está convencido que existe la necesidad de una Política Nacional de Alimentación y Nutrición, la cual, para ser efectiva, debe estar integrada y ocupar un lugar preponderante dentro de la Política Nacional de Desarrollo Económico y Social del país; ya que el estado nutricional de la población al estar directamente relacionado con numerosos factores condicionantes que afectan la disponibilidad, el consumo y el aprovechamiento biológico de los alimentos, depende de casi todo los sectores económicos y sociales del país, teniendo mayores repercusiones en los sectores: Agropecuarios, Salud y Educación.

De esta manera y con el objeto de asegurar la coordinación entre las políticas y acciones de cada sector, para disminuir en forma gradual y progresiva la magnitud del problema de la desnutrición, el gobierno creará una Comisión Intersectorial de alto nivel (Ministro de Estado), que asesorada por un Comité Técnico

Interdisciplinario (cuyo personal provenga de todos los sectores relacionados directa o indirectamente con el problema) cuenta con la información y elementos de juicio necesarios que permitan tomar decisiones acertadas y establezcan los lineamientos más claros a seguir en cada uno de los sectores; y sea, también un mecanísmo efectivo de evaluación y coordinación de las acciones de los mismos, así como la revisión periódica de la PNAN y su reformulación si así se considera conveniente, quedando la responsabilidad de ejecutar los programas y proyectos a las instituciones directamente relacionados con los mismos.

También con el objeto de asegurar la implementación de la Política Nacional de Alimentación y Nutrición, la Comisión Intersectorial a través del Comité Técnico deberá elaborar un Plan Nacional de Alimentación y Nutrición conteniendo los programas, proyectos y actividades necesarias para el cumplimiento de los objetivos generales y específicos de la misma.

4. ASPECTOS GENERALES DE APLICACION:

4.1 Rol del Gobierno

A) Aspecto Legal:

Promulgará las leyes y decretos que considere necesarios para el logro de los objetivos de la PNAN.

B) Aspecto Administrativo:

El Gobierno, a través de la Comisión Intersectorial y ésta a su vez asesorada por el Comité Técnico In-

terdisciplinario, realizará:

- Todas las acciones que sean necesarias para asegurar la participación de la comunidad. (acciones tales como: Capacitación de líderes comunitarios, organización de grupos comunales, educación nutricional, etc.)

- Llevará a efecto un inventario de recursos humanos con el objeto de conocer la situación de estos recursos en relación a las necesidades de los mismos y tomará las medidas para satisfacerlas.

- Gestionará el financiamiento externo necesario para implementar los programas y proyectos contemplados en el Plan Nacional de Alimentación y Nutrición, comprometiéndose a suministrar los fondos de contra-partida requerida en cada caso.

C) Aspecto Presupuestario:

- Asignará las partidas presupuestarias necesarias que permitan el eficiente funcionamiento de la Comisión Intersectorial y su Comité Técnico.

- Garantizará el presupuesto adicional a los sectores involucrados, para que el componente nu-

tricional sea integrado dentro de sus planes sectoriales.

4.2 Papel de la Comunidad y Sector Privado

Los individuos deberán, dentro de su comunidad, participar en forma activa en la ejecución de los programas y proyectos contemplados en la Política Nacional de Alimentación y Nutrición.

Se tratará de contar con la participación directa del Sector Privado en la formulación y ejecución de los programas y proyectos del PNAN, en coordinación con la Comisión Intersectorial y los demás sectores involucrados; logrando así mismo, unificación de criterios en cuanto a la ejecución de leyes y reglamentos que se emitan en relación al mejoramiento del problema nutricional.

5. OBJETIVOS FUNDAMENTALES Y ESTRATEGIA GENERAL DE LA PNAN

La situación nutricional de Nicaragua, descrita anteriormente, ha conducido a la adopción de los siguientes objetivos políticos, que vienen a constituir los elementos orientadores de una estrategia a corto y mediano plazo.

1) Crear, mantener y desarrollar en base a los grandes lineamientos de la Política Nacional de Desarrollo Económico y Social, cambios que conduzcan al mejoramiento sostenido de la situación Nutricional.

2) Lograr que los sectores relacionados con el problema, integren dentro de sus actividades, componentes nutricionales que coadyuven a la obtención de : Mejores Niveles de disponibilidad de alimentos, como un instrumento que asegure el consumo adecuado de la población; incremento en la cantidad y calidad de los mismos a fin de proporcionar a la población una dieta acorde con sus necesidades, y finalmente promuevan al mejoramiento de las condiciones que afectan la eficiencia con que el organismo aprovecha biológicamente los alimentos consumidos.

3) Mejorar los sitemas de investigación, planificación, información, asistencia técnica, adiestramiento de personal y sistema de organización y funcionamiento a nivel institucional.

Considerando que el problema nutricional afecta principalmente a los estratos de bajos ingresos y dentro de estos a mujeres embarazadas, lactantes y niños menores de cinco (5) años, siendo su prevalencia mayor en las áreas rurales, las acciones se orientarán de acuerdo a los objetivos fundamentales de la Política Nacional de Alimentación y Nutrición; prioritariamente hacia esos grupos poblacionales afectados, así como también hacia las áreas rurales de las regiones II y V donde el Gobierno desde ya, ha iniciado programas integrales de desarrollo rural.

..../

6. POLITICAS DE SECTORES DIRECTAMENTE RELACIONADOS CON EL PROBLEMA NUTRICIONAL.

Cabe aclarar que existiendo en cada sector a analizarse, políticas que directa e indirectamente tienden hacia el mejoramiento del nivel de vida de la población Nicaraguense, y para efectos de determinar específicamente, los objetivos, acciones y estrategias a seguirse por los mismos, se tomaron como base, las políticas existentes, tratando de incluir de la mejor forma posible la variable nutrición, con el deseo de lograr una interacción que llevada a cabo eficientemente, venga a constituir en si, un medio para disminuir gradual y progresivamente el problema que se está tratando.

A) Política Agropecuaria.—

El sector agropecuario desempeña un papel vital con el desarrollo económico y social del país; tanto por su participación en el producto interno bruto como por su grado de incidencia en la balanza de pagos, agregándole a lo anterior, su significación desde el punto de vista demográfico y laboral; ya que un 52.2% aproximadamente de la población, radica en zonas rurales, constituyendo la proporción de las personas económicamente activas en dicho sector, un orden de magnitud de alrededor del 40.0% (según datos de UASS).

Además, según estudios realizados por la Unidad de Análisis del Sector Salud (UASS), queda claramente planteado la relación

directa que existe entre este sector y los tres factores fundamentales que determinan el Estado Nutricional de la población; por lo tanto, es lógicamente aceptable incluir dentro de la Política Agropecuaria existente la variable NUTRICION, para que integrada en sus planes de desarrollo, contribuya en parte al logro de los objetivos pre-establecidos por la Política Nacional de Alimentación y Nutrición.

En base a lo antes señalado, se determina como principal objetivo de política para este sector, el mejoramiento del nivel de vida de la población desde el punto de vista nutricional, a través de un mayor acceso de la misma a la corriente de bienes y servicios básicos necesarios para un dieta equilibrada, con la participación activa de los individuos en las decisiones que afectan su propio mejoramiento, lo cual se logrará mediante acciones encaminadas hacia:

1. Redistribución del Ingreso especialmente en la zona rural.
2. Fortalecer la política de Reforma Agraria existente.
3. Regionalizar y unificar las actividades productivas.
4. Incorporación de los recursos no utilizados.
5. Diversificación de la producción agropecuaria.
6. Ampliar oportunidades de empleo productivo con los salarios.
7. Fomentar la educación nutricional, especialmente en la zona rural.

8. Asegurar la disponibilidad interna de los alimentos, mediante medidas apropiadas de exportación e importación de los mismos.

9. Procurar la adecuada conservación de los granos básicos.

10. Propiciar la estabilidad de precios de los productos alimenticios.

Con el propósito de alcanzar las acciones mencionadas, la estrategia para el sector se orientará fundamentalmente hacia la investigación, planificación y selección de proyectos agrícolas prioritarios que coadyuven al crecimiento sostenido y diversificado de la producción, así mismo, manteniendo programas educativos colaterales tendientes a modificar, si fuese necesario, patrones alimenticios existentes, lo mismo que formas de utilización del presupuesto familiar.

b) Política de Salud.

La salud está en relación directa con el aprovechamiento biológico de los alimentos y este a su vez está determinado por el grado de adecuación de la vivienda, eficientes sistemas de eliminación de excretas y aprovisionamiento de agua; cuya carencia afecta a extensos sectores de población, favoreciendo el desarrollo de enfermedades infecciosas y parasitarias que redundan en el desaprovechamiento biológico de alimentos y nutrientes.

Por tanto, una Política de Nutrición y Alimentación en este sector es básica; teniendo como objetivo fundamental, mejorar la distribución de los beneficios de los servicios de Salud a los

grupos de población menos favorecidos, lo cual, se logrará mediante:

- Mejoramiento de los factores ecológicos del medio, tendientes a disminuir las enfermedades infecciosas y parasitarias.
- Extender los servicios básicos de salud al área rural.
- Mantener actualizado el diagnóstico de la situación nutricional del país.
- Reglamentar sistemas de control e higiene de los alimentos.
- Promover entre la población la educación en salud necesaria.

La estrategia se orientará hacia la expansión de la cobertura de los servicios que promuevan la salud de la población, hacer cumplir los reglamentos establecidos y educar a las personas sobre aspectos relacionados con la higiene y la salud y el consumo de alimentos.

c) Política de Educación.

Según el diagnóstico de la situación Nutricional actualizado por la UASS, hoy día existe en Nicaragua una cobertura de 68.4% en cuanto a matrícula de la población de edad escolar (7 a 12 años). Esto puede considerarse aceptable, aunque se sabe que la mayoría de los escolares no terminan la escuela primaria.

Siendo pues, considerable la cobertura del sector educación en el país, si se le compara con los demás sectores, se establece como principal objetivo de Política, la enseñanza de los conocimientos necesarios con el fin de prevenir la desnutrición en los educan-

dos y en sus futuras familias; objetivo que se logrará a través de las siguientes medidas de Política:

- Ampliar la infraestructura educativa, principalmente en área rural.
- Promover en la población la educación nutricional, haciéndola participar en todas las actividades.
- Adiestrar y capacitar en salud y nutrición, a los recursos humanos necesarios.
- Asignar a las áreas prioritarias, maestros capacitados en Salud y Nutrición.

La estrategia consistirá en fomentar la educación nutricional a través de los medios de comunicación masiva, promotores de Salud e incluyendo en los programas de educación sistemática formal, la enseñanza de salud y nutrición; dotando simultáneamente las áreas prioritarias, de la infraestructura necesaria para el debido proceso educativo.

REPUBLICA DE NICARAGUA — AMERICA CENTRAL

LA GACETA

DIARIO OFICIAL

Director: CLIFFORD C. HOOKER y REYES
Administrador: Sra. Miriam López H.
Apartado Postal N° 88 — Teléfono 2-3791

AÑO LXXXI | Managua, D. N., Sábado 23 de Abril de 1977 "Año del Desarrollo Agro-Industrial" | No. 88

SUMARIO

PODER EJECUTIVO

Ministerio de la Gobernación

Créase Comisión Intersectorial para la Alimentación y la Nutrición (CIPAN)

EL PRESIDENTE DE LA REPUBLICA,

en uso de las facultades que le confiere el Arto. 190 Cn., acápite (9 y el Decreto Legislativo N° 618 del 15 de Marzo de 1977, publicado en "La Gaceta", Diario Oficial N° 62 del 16 de Marzo de 1977.

D e c r e t a :

Arto. 1°—Se crea dentro del Poder Ejecutivo, un organismo que tendrá a su cargo la Política Nacional de Alimentación y Nutrición de la población, con las facultades que le otorga la presente ley y las que le señala en reglamento correspondiente. Dicho organismo, que en el presente texto se designará también con el sólo nombre de "Comisión", se llamará COMISION INTERSECTORIAL PARA LA ALIMENTACION Y LA NUTRICION (CIPAN).

Arto. 2°—La comisión tendrá como objetivos principales, elaborar y proponer al Presidente de la República, para su aprobación definitiva, los Planes de Política Nacional de Alimentación y Nutrición, coordinar y evaluar su ejecución mediante los programas y proyectos correspondientes.

Arto. 3°—La Comisión realizará sus funciones, a través de un Directorio y de un Comité Técnico. El Directorio estará integrado por el Ministro de Salud Pública, quien lo presidirá, por el Ministro-Director de Planificación Nacional y por los Ministros de Agricultura y Ganadería, Educación y el de Industria y Comercio. El

Comité Técnico estará integrado por especialistas en nutrición y alimentación, el cual se encargará de hacer los estudios, análisis y recomendaciones, para que la Comisión pueda llevar a cabo la política nacional de alimentación y nutrición. El Jefe del Comité Técnico será nombrado por el Directorio y actuará como Secretario de éste.

Arto. 4º—El Directorio tendrá a su cargo el cumplimiento de las funciones que señala el Arto. 2o. de esta ley, con la colaboración del Comité Técnico. El Presidente del Directorio tendrá la representación extrajudicial de la Comisión con las facultades de un Apoderado General de Administración.

Arto. 5º—Todas las Instituciones Estatales deberán prestar su colaboración a la Comisión para que ésta cumpla a cabalidad con sus funciones.

Arto. 6º—El Departamento Central de Presupuesto del Ramo de Hacienda y Crédito Público, los fondos necesarios para el funcionamiento de la Comisión.

Arto. 7º—El presente Decreto entrará en vigor a partir de su publicación en "La Gaceta", Diario Oficial.

Dado en Casa Presidencial. Managua, Distrito Nacional, a los quince días de Abril de mil novecientos setenta y siete. — (f) *A. SOMOZA*, Presidente de la República. — (f) *Antonio Mora R.*, Ministro de la Gobernación

Ministerio de Educación Pública

Extiéndese Título de Licenciado en Administración de Empresas a Sr. José I. Morales G.

Reg. No. 2719 — R F 613015 — C$ 75.00

No. 28—T.

EL PRESIDENTE DE LA REPUBLICA,

Considerando:

Que la Universidad Centroamericana, que funciona en esta ciudad, pide se le extienda el Título de Licenciado en Administración de Empresas, al señor *José Ignacio Morales González*, natural de Managua, Departamento de Managua, República de Nicaragua, en virtud de haberle conferido el correspondiente Diploma, a los diecinueve días del mes de Enero de mil novecientos setenta y siete,

Acuerda:

1.—Extenderle al señor *José Ignacio Morales González*, el Título de Licenciado en Administración de Empresas, para que goce de todos los derechos y prerrogativas que le conceden las leyes de la República y reglamentos del ramo.

2.—El presente Acuerdo para su validez, deberá ser publicado en "La Gaceta", Diario Oficial, por cuenta del interesado.

Comuníquese: Casa Presidencial. Managua, D. N., catorce de Marzo de mil novecientos setenta y siete. — *A. SOMOZA*. D. Presidente de la República. — *Rubén Sobalvarro*, Ministro de Educación Pública.

Extiéndese Título de Licenciado en Contaduría Pública a Sr. Juan Ernesto Machuca S.

Reg. No. 2727 — R F 610382 — C$ 75.00

No. 25765

EL MINISTERIO DE EDUCACION PUBLICA,

Considerando:

Que el Centro de Estudios Superiores, que funciona en esta ciudad, pide se le extienda el Título de Licenciado en Contaduría Pública, al señor *Juan Ernesto Machuca Soza*, natural de Managua, Departamento de Managua, República de Nicaragua, en virtud de haberle conferido el correspondiente Diploma, a los diecinueve días del mes de Septiembre de mil novecientos setenta y cinco.

Acuerda:

1.—Extenderle al señor *Juan Ernesto Machuca Soza*, el Título de Licenciado en Contaduría Pública, para que goce de todos los derechos y prerrogativas que le conceden las leyes de la República y reglamentos del ramo.

2.—El presente Acuerdo para su validez, deberá ser publicado en "La Gaceta", Diario Oficial, por cuenta del interesado.

Ministerio de Educación Pública. — Managua, Distrito Nacional, doce de Noviembre de mil novecientos setenta y cinco. — *LEANDRO MARIN ABAUNZA*, Ministro de Educación Pública. — Ante mí: *Jesús Howay Ubeda*, Director de Servicios Administrativos del Ministerio de Educación Pública.

ANNEX II H

NUTRITION GRANT FINANCIAL STATUS AS OF JULY 31, 1977

Pro-Ag 76-16	Originally Planned in Pro-Ag ($)	Committed	Additional Programmed ($)	Disbursed* (6/30/77) ($)
1. Technical Assistance	117,000	101,400 1/	15,600 2/	23,300
2. Operating Costs	10,000	1,000	9,000 3/	1,000
3. Training	6,000	6,000	-	4,700
4. Seminars	6,000	2,300	3,700 4/	2,300
5. Commodities	-	6,700	-	6,700
6. Translations/Publications	11,000	1,400	2,900 5/	1,300
Sub-Total		118,800	31,200	
TOTAL	150,000	150,400		39,300

Pro-Ag TQ 76-1				
1. Technical Assistance	97,000	104,700 6/	-	11,[illegible]00
2. Operating Costs	130,000	41,800	71,100 7/	9,100
3. Training	12,000	8,100	-	1,500
4. Commodities	11,000	15,700	-	4,400
Sub-Total		170,300	71,100	
TOTAL	250,000	241,400		29,200

* According to USAID records.

1/ Technical assistance for the NEIS, National Food Distribution Study, short and long-term nutrition advisors.

2/ Includes additional technical assistance for the NEIS and a short extension of long-term nutrition advisor's contract.

3/ National Nutrition Baseline Survey costs.

4/ Several Seminars are planned for September-December 1977.

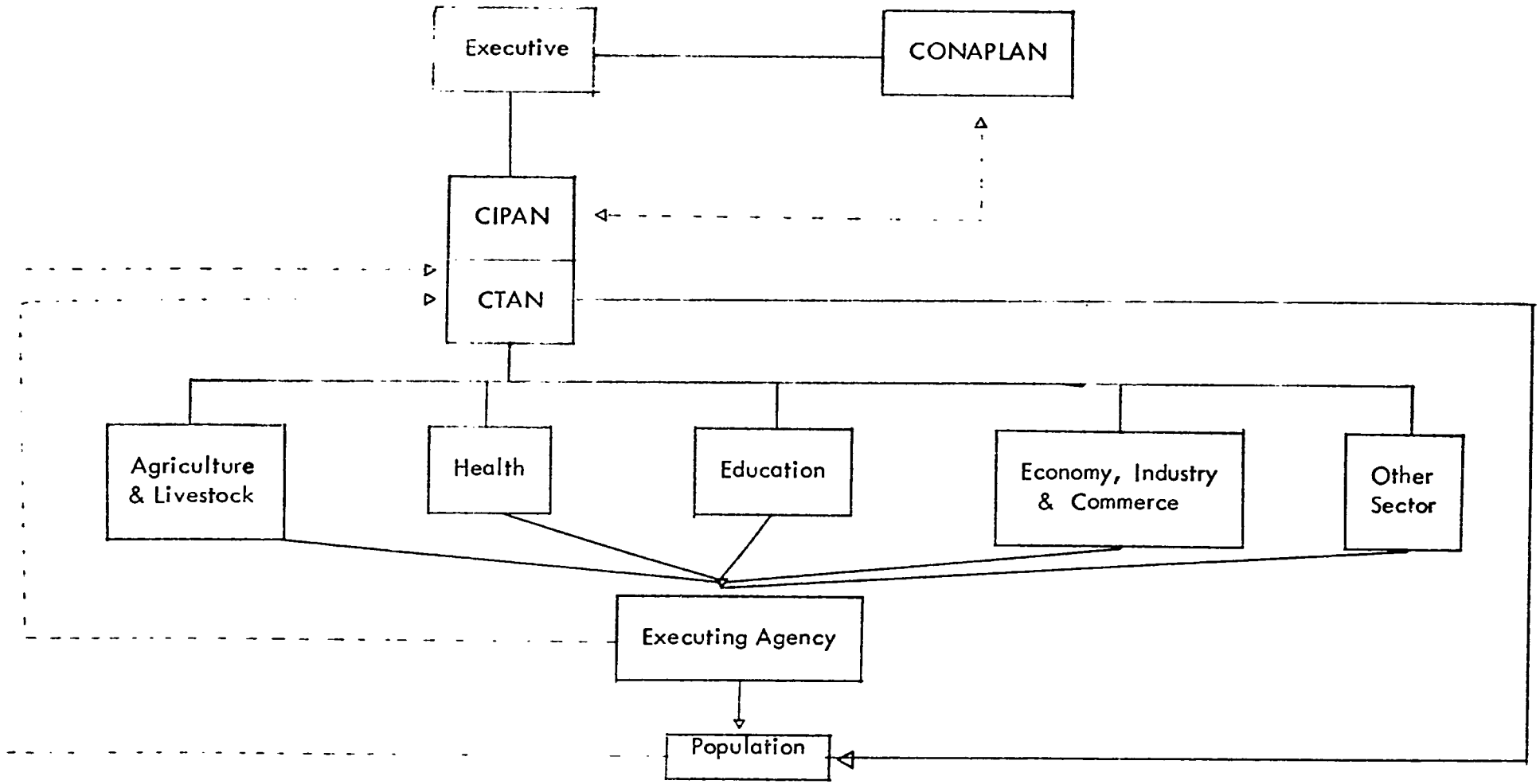
5/ English/Spanish translations, purchases of books, and subscriptions.

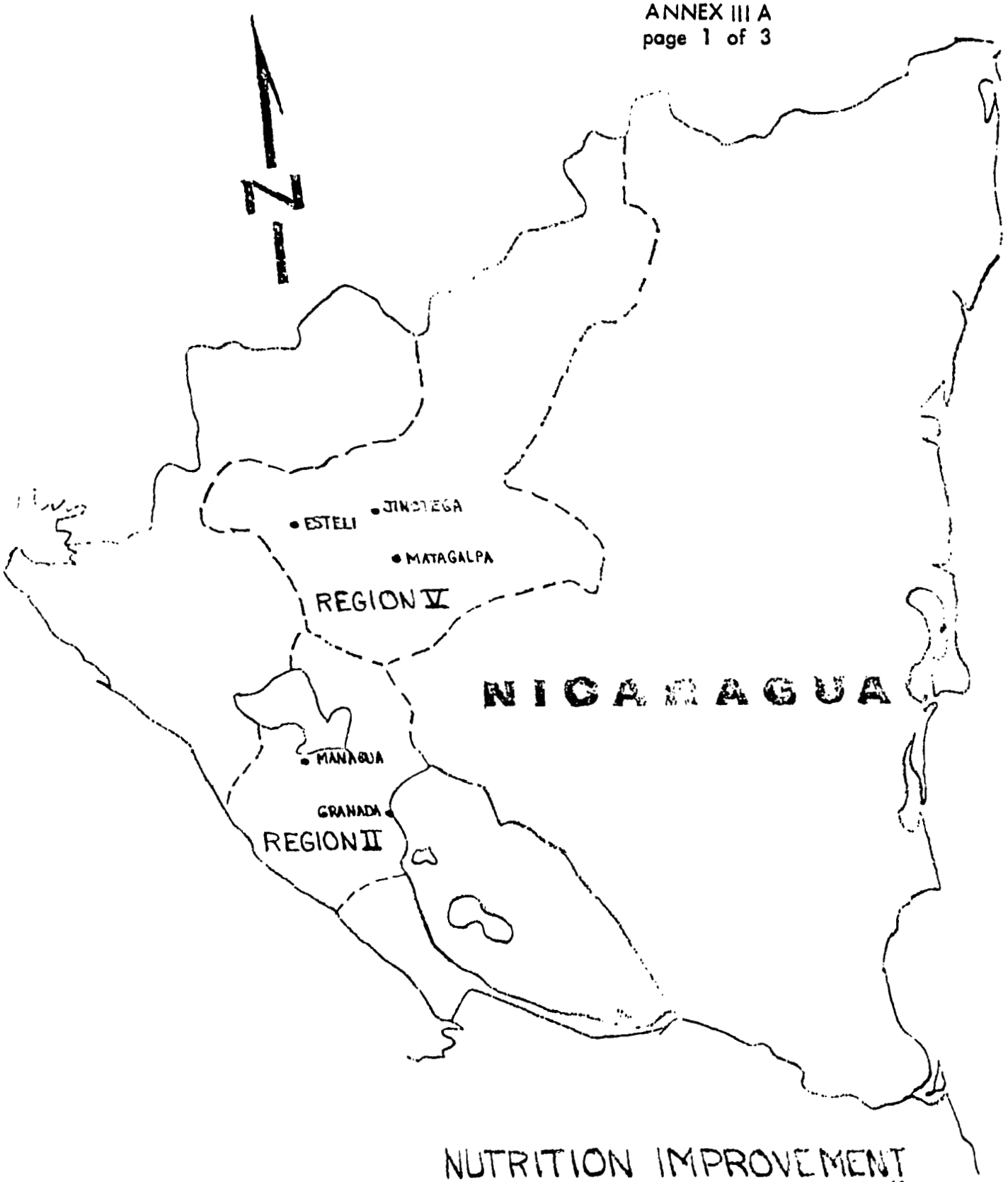
6/ Technical assistance for Mass Media Nutrition Education, Nutrition Education, National Food Distribution Study, Evaluation of Supplementary Feeding Programs, Integration of nutrition into Rural Development Programs, Study of Day Care Centers as a vehicle for Nutrition, and Preliminary Nutritional Profile of a Marginal Urban Area in Managua.

7/ Includes additional funds for the National Nutrition Baseline Surveys costs and definition of working arrangements and scopes for R & D of the low-cost blended food, publicity on CTAN and iodized salt; and observational trips to other countries in order to learn from their programs, and possible transfer of funds to 2/ above.

ANNEX II 1

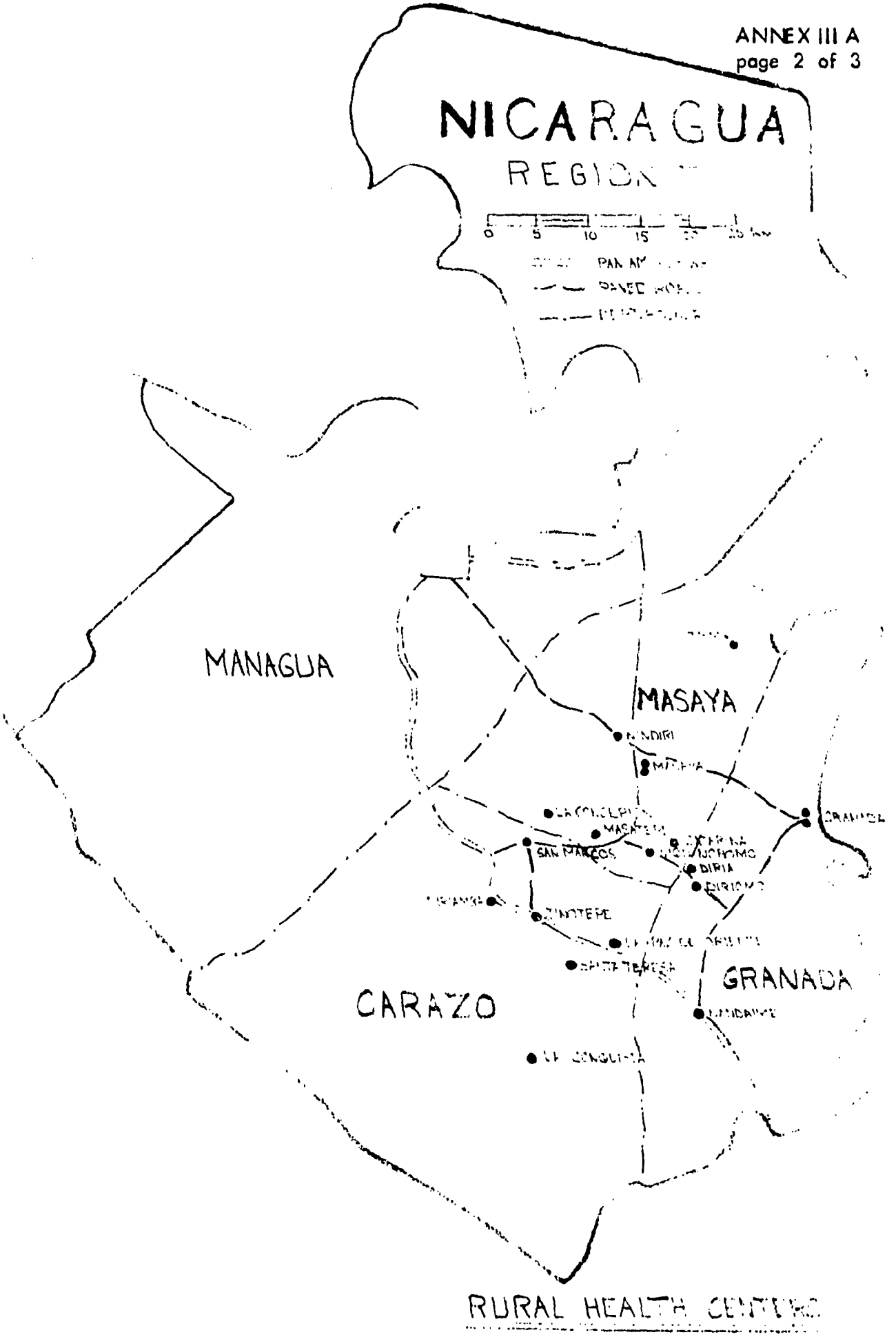
NFNP COORDINATION AND EXECUTION MECHANISM





NUTRITION IMPROVEMENT

IMPACT AREA - REGIONS II + V



RURAL HEALTH CENTERS

RURAL HEALTH CENTERS

LOGICAL FRAMEWORK MATRIX OF NUTRITION IMPROVEMENT PROGRAM

Project Costs	Indicators	Verification	Assumptions
Societal Goal: To improve the nutritional status and well being of Nicaragua's rural poor	Decrease in the incidence/prevalence of: i) Protein-calorie malnutrition; ii) Endemic goiter; iii) Anemias; iv) Vitamin A, riboflavin and other nutritional deficiencies	1) Pre and post surveys and evaluations 2) Community level records 3) Nutrition Evaluation and Information System 4) Morbidity-mortality report of MOH 5) Patient and cumulative records rural health centers	1) No new nutritional problems become prevalent in next 5 years 2) Demographic growth does not cancel out positive changes in food habits, availability or health status.
Composite Program Purposes: 1) Improve the food habits of target groups. (Components I, III and IV)	End of Project Status: 1) Increased breast feeding, improved consumption pattern of pregnant lactating women, intrafamily distribution of food favors MARP, less consumption of maizena relative to consumption of more nutritious beverages by 0-5 yr. olds, etc.	1) NEIS and special surveys	1) Political stability 2) GON support for IRD programs continue 3) CTAN coordination efforts supported by other ministries.
2) Increase the availability of nutrients to target groups. (Components I, II, III and IV.)	2) a) Almost all salt consumed in Nicaragua has been iodized. b) Low cost, high protein, popularly accepted, blended food product developed and ready for mass marketing c) Feasible Food Availability Pilot Projects d) Family gardens/patio crops patterned after school gardens e) Export/imports and Food Production Policy revisions lower (or minimize increase of) local food prices f) Iron tablets and multivitamin pills readily available to more pregnant and lactating women	2) a) Iodization regulation inspections of retail outlets and productive facilities. b) Feasibility and Acceptability Studies. c) " " " d) Report from community level workers e) Analysis of Policy Changes and Impacts f) MCH and community level workers reports	4) Target group can be motivated to change food habits in order to improve nutritional status. 5) Populace accepts minor price increase and taste change of salt when iodized.
3) Reduce the prevalence/incidence of health problems that inhibit physiological utilization of food by target group. (Components I, III and IV).	3) Reduction of gastro-enteritis, diarrhea and communicable diseases	3) NEIS	

LOG FRAME
COMPONENT ONE OUTPUTS - INPUTS

Outputs:	Indicators:	Means of Verification:	Assumptions:
1) Master Nutrition Education Program developed	1) Comprises 8 curricula, and is being used by delivery mechanisms.	1) Attendance records and quarterly progress reports, and field inspection	1) Adequate and responsive technical services available.
2) Non-Formal Nutrition Education Mechanism developed, installed and functioning	2) a) "Whaddya Know Traveling Food Show" reaches 77,500 with 15 basic concepts and provides regional recipes b) Short-courses and seminars in nutrition held for public and private change agents c) PRACS reach 122,500 with 15 basic concepts	2) " " "	2) A.I.D. inputs made on timely basis.
3) Incidental Nutrition Education Mechanisms developed, installed, and functioning	3) a) 12 radio messages designed and aired (coverage 1.5 million). b) Audio-visual and printed materials developed and distributed c) Mobile demonstration unit equipped and tested in field. d) Experimental kitchen experimenting and developing recipes	3) " " "	
4) Formal Nutrition Education Mechanisms developed and functioning	4) Approximately 11,700 primary school students get basic nutrition education	4) " " "	

Inputs: ($000)

	AID(L)	AID(G)	GON
Commodities	140	-	30
Technical Assistance	30	160	-
Training	120	-	35
Other Costs	960	15	1035
Inflation/ Contingency	140	-	-
Total	1390	175	1100

LOGFRAME

COMPONENT TWO OUTPUTS-INPUTS

Outputs:	Indicators:	Means of Verification:	Assumptions:
1) Capacity installed for iodization of salt and enforcement mechanism developed.	1) a) 9 plants have installed capacity. b) Enforcement unit has sufficient staff and authority.	1) Inspections of plants and evaluation of enforcement unit.	1) Adequate and responsive technical services available. 2) A.I.D. inputs made on timely basis.
2) Feasibility of Blended Food Product using jicaro tested.	2) a) Availability and costs of production analyzed. b) Pilot plant built and operated and processing factors analyzed. c) Distribution, storage and acceptability analyzed. d) Four products produced and tested.	2) Progress Reports.	
3) Other Pilot Food Availability Projects Tested.	3) a) Community stores and granaries. b) Other possible fortification schemes. c) Patio crops. d) Food cooperative study and design. e) Other Pilot Projects.	3) Progress Reports.	
4) Emergency Food Shortage Project designed.	4) a) Existing plans and policies reviewed. b) Recommendations developed for improving responsive capability of GON.	4) Progress Reports.	

Inputs: ($000)

	A.I.D. (L)	A.I.D. (G)	GON
Commodities	325	-	115
Training	-	-	-
Technical Services	35	100	-
Operating Costs	90	-	427
Inflation Contingency	50	-	-
	500	100	542

LOGFRAME

COMPONENT THREE OUTPUTS-INPUTS

Outputs:	Indicators:	Means of Verification:	Assumptions:
1) Rural Community Nutrition Surveillance System established	1) a) 60 health educators, 120 rural health collaborators and 350 volunteer anthropometrists trained in nutrition b) 350 anthropometrists trained in weighing c) 4,900 children 0-1 yrs. and 22,050 children 1-5 yrs. participating in weighing program. d) 122,500 people in 350 rural communities receive nutrition education.	1) Quarterly reports	1) Adequate and responsive technical services available. 2) A.I.D. inputs made on timely basis.
2) Rural Community Deparasitization Campaign	2) a) Curriculums revised to include deparasitization instructions b) 60 rural health educators, 120 rural health collaborators and 45 rural health nurses trained in use of Mebendozole	2) Quarterly reports	
3) Improved therapeutic and diagnostic services of 37 rural health centers.	3) a) 45 rural health nurses/auxilliaries and 20 rural laboratory technicians receive training b) Vitamins, minerals and/or folic acid distributed to 16,000 pregnant women, 16,000 lactating mothers, 16,000 0-1 yr. olds and 48,000 1-5 yr. olds.	3) Quarterly reports and health center records	

Inputs:

($000)

	A.I.D. (L)	A.I.D. (G)	GON
Commodities	620	-	250
Training	-	75	-
Technical Services	130	-	-
Other Costs	-	-	635
Inflation-Contingency	85	-	-
Total	835	75	885

LOG FRAME
COMPONENT FOUR OUTPUTS-INPUTS

Outputs:	Indicators:	Means of Verification:	Assumptions:
1) Operational NEIS	1) a) 504 field collection points gathering data. b) Nutritional indicators sensitive. c) Data collection systems evaluated d) 10 GON institutions participate e) 726 personnel trained in data collection. f) Newsletter, feedsback appropriate data to contributing agencies. g) Includes nutrition impact project evaluations.	1) Progress reports and review of documents	1) Adequate and responsive technical services available. 2) A.I.D. inputs made on timely basis.
2) Sector policies impacting on nutrition evaluated	2) At least 3 position papers presented to CIPAN which would include a) History and impact of policy b) Alternative policy with more favorable or less unfavorable impact on nutrition c) Methodology for alternative plans of action	2) " " "	
3) Evaluation capacity of implementing agencies improved	3) Appropriate officials from implementing agencies selected and trained in basic and applied nutrition evaluation.	3) " " "	
4) Improved capacities of CTAN to plan, coordinate and evaluate	4) a) Staff increased from 21 to about 30 b) Quality of planning documents improve while dependence on T.A. reduced c) Able to design and conduct evaluations without outside assistance d) Minimal bureaucratic messups	4) " " "	

Inputs:

(S000)

	A.I.D. (L)	A.I.D. (G)	GON
Commodities	20	21	7
Technical Assistance	-	24	-
Training	100	82	73
Operational Costs	130	23	1747 *
Inflation-Contingency	25	-	-

* Includes 4 yr. probable CTAN budget.

ANNEX III C

DETAIL OF COMPONENT ONE

This Annex contains:

1. The Hot/Cold Food "System".
2. Timetable of Component One.
3. Illustrative Breakdown of GON and A.I.D. Inputs and Budget for Component One.
4. Cost Estimates of Material Production for Target Groups.
5. Details on Experimental Kitchen Equipment.

THE HOT/COLD FOOD "SYSTEM"*

Food	Strachan's Data	Forman's Data 1	Forman's Data 2	Saravia's Data
fish/sea food	cold			cold
pork	cold	not/	cold	
chicken, young	cold	hot		
laying hen	hot			
bull meat	cold	hot		
other beef	hot	hot		
iguana	cold			cold
lemons/oranges	cold	cold		
pineapple	cold			
watermelon	cold			
bananas	cold			
plátano	cold	cold		
guineo	cold			
tomatoes	cold			
fruit juices	cold			cold
yuca	cold			
squash	neutral or cold	cold		
rice	neutral or cold	cold		
lard	cold			
bread	neutral			
tortilla	neutral			
cuajada/cheese	neutral			
green beans	neutral			
milk	neutral			
elote/chilote	hot	hot		hot
beans	hot	hot	hot	hot
chili	hot			
coffee	hot	hot		
boiled water	hot			

The hot/cold system when dealing with illness generally (but not always) operates in terms of opposites: when a person has a "cold" illness, she/he should protect against adding more "cold" to the body and hence should avoid "cold" foods and consume "hot" ones, and vice versa. Illnesses generally thought to be "cold" are: colds and respiratory infections, malaria, fevers associated with respiratory infections. A woman in the post-partum period is also "cold". "Hot" illnesses are: measles, colic, diarrhea, typhoid, diseases of the liver, kidneys and stomach. Also, pregnant women are "hot".

*From: Forman, S.A. "Report on Food Practices of Lower-income Nicaraguans and Cultural Considerations in Changing Food Practices", presented to USAID/Nicaragua, May, 1977.

Timetable of Component One

	Event	Starting Date
a)	Definition of Minimum Basic Concepts and facts	By December, 1977
b)	Development of Nutrition Education Materials	(Beginning Date)
	i. Design of Eight Curricula	By January 1978
	ii. Design of Audio-Visual Materials	By March, 1978
	iii. Design of Traveling Food Show	By March, 1978
	iv. Initial Printing and Reproduction of Materials	By April, 1978
c)	Training	
	i. Institutional Trainers	By July, 1978
	ii. Social Promoters	By September, 1978
	iii. Other Community Field Workers	By September, 1978
	iv. Community Informants	By September, 1978
	v. Teachers	By November, 1978
	vi. SERN Workers	By December, 1978
	vii. Students	By February, 1979
d)	Airing of Radio Messages	By January, 1978
e)	Distribution of Posters/Pamphlets	By August, 1978
f)	Mobile van unit	
	i. Recruitment Training of Personnel	By November, 1978
	ii. Operational phase	By December, 1978

ANNEX III C - Illustrative Breakdown of GON and AID Inputs and Budget for Component One

	A. I. D.					G. C. N.				
	1978	1979	1980	1981	TOTAL	1978	1979	1980	1981	TOTAL
1. Development of Educational Material										
A. Design of 8 curriculum										
TA, school curriculum 12 months*	60,000(G)									
2 TA, non-formal curriculum 20 p.m.**	80,000(G)	20,000(G)								
Native writer, 12 months (6-2-2-2)						6,000	2,000	2,000	2,000	
Education Curriculum Team (16 p.m.)						32,000				
TA, pre-school education (2 p.m.)	10,000									
B. Material Design and Preparation										
TA, Mass Media, 2 months	20,000									
1 writer, 15 months (9-2-2-2)						9,000	2,000	2,000	2,000	
3 artists, 12 months each						18,000	18,000	18,000		
Testing of radio messages and other materials						10,000	11,000	12,000		
1 nutrition auxiliary (exp. kitchen)						1,800	3,600	3,600	3,600	
1 nutritionist						3,600	7,200	7,200	7,200	
C. Material Production										
Training packages										
(See Page 6 for details)	150,000	200,000	280,000						150,000	
12 radio messages	1,800	1,800	4,400							
Other materials (posters, tapes)	20,000	20,000	20,000							
D. Mobile Demonstration Units										
2 vehicles	10,000			10,000						
Audio-visual equipment at $5,000 per vehicle	5,000			5,000						

* Initial 2-3 months for Component Three, element III
** 1 TA for 4 p.m. for Component Three, elements I and II
1 TA for 16 p.m. for follow-through of Component One.

	A. I. D.					G. O. N.				
	1978	1979	1980	1981	TOTAL	1978	1979	1980	1981	TOTAL
Travelling entertainers (teams of 5)	15,000	30,000	30,000	60,000						
Gas (400 miles per week at 10/mi/gal, at $1 per gal.)						1,100	2,200	2,200	4,400	
Maintenance of vehicles (30% of gas costs)						400	700	700	1,500	
2. Equipment										
Radio time						120,000	132,000	144,000	144,000	
6 film projectors at $584 ea.	3,500									
6 slide projectors at $184 ea.	1,100									
6 overhead projectors at $200 ea.	1,200									
12 screens at $55 ea.	700									
Books, films, subscriptions, etc.	300 (60 schools)	300 (100 schools)	300 (40 schools)							
200 radio-tape recorders for classes at $100 ea.	6,000	10,000	4,000							
200 school garden kits at $100 ea. (shovels, rakes, etc.)	6,000	10,000	4,000							
200 school food demonstration kits at $200 ea. (portable gas stoves, pots & pans, cups, etc.)	12,000	20,000	8,000							
Experimental kitchen (see Page 9 for details)	15,000									
Replacement parts (batteries, gas for stoves)							4,400	11,600	14,500	
3. Supervision										
4 nutrition auxiliaries, full time, also responsible for some of training						8,400	16,800	16,800	16,800	
1 Regional Nutritionist						5,400	10,800	10,800	10,800	
1 Vehicle	7,000									

	A. I. D.					G. O. N.				
	1978	1979	1980	1981	TOTAL	1978	1979	1980	1981	TOTAL
Gas (70 miles daily, for 270 days, at 10 mi/gal., at $1/gal.)						900	1,800	1,800	1,800	
Maintenance of Vehicle (30% of gas costs)						300	700	700	700	
Driver's Salary						100	200	200	200	
4. Evaluation										
A. Radio campaign (approx. 700 surveys)		12,000	13,500	15,000						
B. Non-Formal Education (annual surveys and printing of reports)		3,500	4,000	4,500						
C. Formal Education (annual surveys and printing of reports)		2,500	2,500	3,000						
5. Training										
A. 10 in-service trainers from different institutions, for 2 weeks. One instructor and 1 TA										
- per diem, at $20/day/person, for 12 days	2,800									
- transportation (drivers, gas)						100				
- rent of classroom	300									
- materials	100									
B. MDE training of 240 rural teachers*, in sessions of 20, 2 wks. long. Total of 12 sessions (2-6-4) TA present										
- salary of trainer ($250/wk)						1,000	3,000	2,000		
- salary of teachers ($50/wk)						4,000	12,000	8,000		
- per diem, at $20/day/person for 12 days	10,600	31,800	21,200							
- transportation						200	600	400		
- rent of classroom	200	600	400							
- materials	100	200	100							
	(2 sessions)	(6 sessions)	(4 sessions)							

*average of 1.2 teachers per school
200 schools = 240 teachers

	A. I. D.					G. O. N.				
	1978	1979	1980	1981	TOTAL	1978	1979	1980	1981	TOTAL
C. INVIERNO and INTA training of 18 social promoters and 4 home economists, 2 weeks.										
- per diem, at $20/day/person for 12 days	5,800									
- transportation						100				
- rent of classroom	200									
- materials	100									
D. INVIERNO training of 100 agromocs, in sessions of 25, 1 wk. long. Total of 4 sessions (2-2)										
- per diem, at $20/day/person for 6 days	6,500	6,500								
- transportation						100	100			
- rent of classroom	200	200								
- materials	100	100								
E. INTA training of 14 ag. extension agents, 1 week.										
- per diem, at $20/day/person for 6 days	2,000									
- transportation						100				
- rent of classroom	100									
- materials	100									
F. Training of Health Educators and Community Collaborators (accounted for under Component Three)										
G. Training of 14 SERN workers, 2 weeks										
- per diem of participants ($20)	3,600									
- transportation						100				
- materials and room	200									

	A. I. D.					G. O. N.				
	1978	1979	1980	1981	TOTAL	1978	1979	1980	1981	TOTAL
H. Training of 600 community advice-givers. 30 sessions of 20 people, 1 wk. (10-10-10)										
- per diem of participants ($5)	6,000	6,000	6,000							
- transportation, materials and room						600	600	600		
I. Training of mobile unit personnel, 2 wks*										
- salary of trainer and materials accounted for in yearly salary, item 4.										
- per diem of participants included in their salaries										
6. Retraining, yearly, for one week										
A. In-Service Trainers, 1 week										
- per diem ($20)		1,500	1,500	1,500						
- transportation							100	100	100	
- materials and room		200	200	200						
B. Community advice-givers 3 sessions yearly of 20 people, 1 week.										
- per diem of participants ($5)		1,800	1,800	1,800						
- transportation							200	200	200	
- materials and room							200	200	200	
C. Mobile unit personnel, 2 weeks.										
- salary of trainer (accounted for under Item 4).										
7. Investigation	20,000	20,000	20,000	15,000(G)		15,000	10,000	10,000	10,000	
8. Subtotal: Grant	140,000	20,000		15,000	175,000					
Loan	343,600	379,000	421,900	101,000	1,245,500	238,300	240,200	255,100	370,000	1,103,600
9. 11% inflation/contingency (loan)					137,000					
TOTAL:					1,557,500					1,103,600

*Training of new teams will be done with retraining of first team.

ANNEX III C - Cost Estimates of Material Production for Target Groups

1. Present needs

Target groups	Curriculum Level	Number	Unit Cost Curriculum Material	Total Cost Curriculum Material (in $000)
Institutional trainers*	4	10	150	1.5
Teachers	3	510	100	51.0
Nurses, auxiliaries	3	45	100	4.5
Health educators	3	60	100	6.0
Social promoters	3	20	100	2.0
Travelling food show	3	10	****	-
Students, grades 5 & 6	2	700	75	52.5
Rural Health collaborators	2	120	75	9.0
Anthropometrists	2	350	75	26.5
Community field workers**	2	100	75	7.5
Community "advice-givers"	2	600	50 (1)	30.0
SERN workers	2	15	75	1.5
Community members***	1	1,000	30	30.0
Laboratory Technicians	2	20	-	-
Students, grades 1-4	1	23,400	15 (2)	230.0
SERN children	1	200	10 (3)	2.0
TOTAL		27,160		454.0

2. Additional material needs for other distribution (to cover new people being trained, etc.)

Level	Unit Cost	Number	Total Cost (in $000)
4	150	50	7.5
3	100	400	40.0
2	75	2,400	180.0
1	30	3,000	90.0
	Total:		317.5

3. Total costs over LOP: $771,500.

---

* PRACS, INVIERNO, IHRH, MPE, INTA, NUTR. DIV.
** SNEM, agriculture extension agents.
*** In organized sessions
**** Accounted for in equipment of mobile unit
(1) Does not include material needed for teaching.
(2) Partially funded by pending Rural Education Development Program.
(3) Special material.

Details on Experimental Kitchen Equipment

"COCINA EXPERIMENTAL Y LABORATORIO DIETETICO DE E. S."

Equipo, utencilios y mobiliario mínimo.-

ARTICULOS	UNIDAD EXPERIMENTAL	UNIDAD DE ENSEÑANZA
- Cocina eléctrica c/gabinete	2	-
- Cocina portatil de 3 quemadores		10
- Refrigeradora de 14 pies		1
- Refrigeradora peq. de 10 pies	1	
- Mantenedora de tipo familiar	1	
- Horno mediano	1	3
- Lavadora de platos automática	1	
- Secadora de platos automática	1	
- Triturador de basura	1	
- Precoladora	1	
- Cafetera eléctrica	1	
- Mezcladora o batidora electrica	1	
- Licuadora tamaño institucional	1	-
- Licuadora tamaño familiar 2 litros	1	3
- Balanza para pesar alimentos en gramos	1	-
- Balanza para pesar alimentos en onzas		3
- Papelera grande con tapa	1	1
- Exprimidor de jugo eléctrico	1	
- Exprimidor de naranja manual	1	10
- Juego de 4 tazones para mezcla	1	5
- Lavatrastos de acero		10
- Batidora para helados eléctrica	1	
- Freidor eléctrico	1	
- Freidor de Omelet (Tortillas)	1	10
- Máquina cortadora universal tamaño familiar	1	-
- Reloj de cocina grande	1	
- Tostadora electrica	1	

ARTICULOS	UNIDAD EXPERIMENTAL	UNIDAD DE INSTRUCCION
- Automatic gill waffer baker	1	-
- Tetera de 2 litros	1	-
- Tetera de 1 litro	1	
- Taza ralladora o cortadora de verduras	1	10
- Tazón colador de pastas cereales	1	10
- Juego para pastelería de 4 tazas y decoradores	1	10
- Moldes para pudín	12	10
- Moldes para queques	3	10
- Moldes para flan	12	10
- Moldes para galletas	12	10
- Moldes para sowffle	3	-
- Moldes para pan frances	3	-
- MOldes para postres	3	10
- Moldes para pastas	3	10
- Bandejas para colocar vegetales	6	-
- Juego de bandejas de acero de 28 -34-39-45 Cms.	1	-
- Recojedor de basura (Con borde de hule)	1	10
- Cepillos para lavar cocina	12	24
- Cepillos para lavar manos uñas	12	24
- Jarras para agua de acero inoxidable (1 LItro)	2	10
- Juego para vinagre, aceite , sal	1	-
- Panera de metal tipo familiar	1	-
- Molde cortador de frutas	1	10
- Juego de tazas de medir	1	10
- Juego de cucharas para medir	1	10
- Rodillos para amasar	1	10
- Tablas para picar	1	10
- Majadores de carne	1	10
- Exprimidor de naranja manual	1	10
- Exprimidor de limón	1	10
- Pinzas para hielo	1	-

ARTICULOS	UNIDAD EXPERIMENTAL	UNIDAD DE ENSEÑANZA
- Plancha y parrilla asador para carnes	1	-
- Tohalleras	1	10
- Repasadores, limpiones, tohallas de c/u	12	24
- Agarradores para caliente	12	24
- Rollos de servilletas de papel para cocina	12	10
- Con su estuche	1	10
- Papel para desgrasar (Cajas)	5	-
- Recipientes para guardar cubiertos	1	10
- Rollos de papel de aluminio	12	10
VAJILLA DE COCINA		
- Cuchillo para pan	2	-
- Cuchillo para carne	2	-
- Cuchillo para vegetales	2	10
- Peladores de tubérculos	2	10
- Cuchillos para cortar y picar	3	10
- Tenedores de cocina de 2 garfios	3	10
- Tenedores de cocina de 3 garfios	3	10
- Espátulas para remover frituras	3	10
- Majadores de vegetales de metal	1	10
- Cortador de queso	1	-
- Cortador de huevo	1	-
- Cucharones corrientes (8 onzas)	3	10
- Cucharones perforados (Escurridores)	3	10
- Cernidor de harinas 7 1/2 pulgadas	2	10
- Cernidor de harinas 8 1/2 pulgadas	2	10
- Cernidor de harinas 10 pulgadas	2	10
- Cernidor de harinas 13 pulgadas	2	10
- Cernidor de harinas 15 pulgadas	2	10
- Batidor manual		10
- Abridores de lata de diferentes usos	1	3

ARTICULOS	UNIDAD EXPERIMENTAL	UNIDAD DE ENSEÑANZA
- Destapador de botella	1	3
- Saca corcho	1	3
- Rallador de verduras y queso de 4 caras	1	10
- Cucharas de cocina lisas	6	10
- Cucharas de cocina caladas	6	10
- Cuchillo corriente de cocina de hoja de 12 pulg.	2	10
- Cuchillo corriente de cocina de hoja de 8 pulg.	2	10
- Cuchillo corriente de cocina de hoja de 6 pulg.	2	10
- Pinzas para mariscos, juego	10	-
- Cortador de tomate	1	3
- Moledor de carne manual	1	-
-		
UTENSILIOS O BATERIA DE COCINA		
- Ollas de presión de 4 litros	1	-
- Ollas de presión de 6 litros	1	-
- Ollas de presión de 8 litros	1	-
- Ollas de baño María mediana (Acero)	1	-
- Olla de baño María grande (Acero)	1	-
- Olla para huevos Poachers		
- Ollas para cocción de acero inoxidable 1 litro	2	10
- Olla para cocción de acero inoxidable de 4 litros	2	10
- Olla para cocción de acero inoxidable de 6 litros	2	
- Olla para cocción de acero inoxidable de 8 litros	1	
- Olla para cocción de acero inoxidable de 10 Lts.	1	
- Olla para cocción de acero inoxidable de 12 Lts.	1	
- Fuentes para guisar (Sartenes) de acero inoxidable o teflón de ½ libra	2	10

../..

ARTICULOS	UNIDAD EXPERIMENTAL	UNIDAD DE ENSEÑANZA
- Fuentes para guisar (Sartenes) de acero inoxidable o tefflón de 4 libras	2	1[illegible]
- " " 5 lib ras	2	[illegible]0
- " " 6 libras	2	-
- . " 1 libras	2	10

NOTA: TODAS ESTAS OLLAS CON TAPADERA

VAJILLA DE SERVICIO

- Platos planos de plásticos fina calidad	12	24
- Platos hondos de plásticos fina calidad	12	24
- Tazas para caldo de plásticos fina calidad	12	24
- Platitos para pan	12	12
- Tazas para leche con su platito	12	24
- Tazas para café	12	24
- Ensaladera plastica	1	
- Cuchillos de mesa acero inoxidable	12	
- Cucharas de sopa	12	
- Cucharitas cafeteras	12	
- Tenedores de acero inoxidable	12	
- Vasos de acero inoxidables	12	24
- Vasos de vidrio	12	
- Sopera de acero inoxidable	2	
- 1 juego de recipientes (4 tamaños) para guardar cereales y otros alimentos secos		

MUEBLES

Muebles con gabinetes de madera y formica	1	
Mesas de trabajo para la práctica de la enseñanza		10
Mesas de trabajo para cocina experimental	1	
Sillas	12	
1 mesa larga de 3 metros	1	

Detail of Component Two

This Annex Contains:

1. The GON's Draft Regulation for the Iodization of Salt (in Spanish).

2. Materials supporting the initial selection of jicaro as focus for the the R&D of a low-cost, high-protein blended food:

   a) Background data.

   b) Preliminary Design and Comments about a Pilot Processing Plant for Vegetable Blend and Jicaro, INCAP, R. Gomez Brenes, July 1977. (Bulk Annex).

   c) Table 1, Plant Design Options Implicit in Gomez Brenes' Flow Charts.

   d) Table 2, Product Composition.

   e) Illustrative Calculations of Jicaro Feasibility.

   d) Bibliography of studies and reports concerning jicaro.

PROYECTO DE REGLAMENTO DE LA LEY SOBRE YODIZACION DE LA SAL

D E C R E T O

El Presidente de la República,

En uso de las facultades que le confiere el Art. 6 de la Ley sobre yodización de la sal, publicado en "La Gaceta", Diario Oficial, No. 43, del 20 de Febrero de 1969,

Decreta:

El siguiente reglamento sobre Yodización de la Sal:

NORMAS GENERALES

Art. 1° Se entiende por sal común, el producto comercial constituído principalmente por el compuesto químico cloruro de sodio. La sal común puede ser para consumo humano, animal o uso industrial.

Toda la sal común que se destine al consumo, tanto humano como animal, deberá estar yodizada de conformidad con lo dispuesto en el presente reglamento.

Art. 2° Toda persona natural o jurídica que se dedique a la producción y procesamiento de la sal común, para operar deberá obtener autorización del Ministerio de Salud Pública, previa certificación de registro del Ministerio de Economía, Indus-

tria y Comercio, a más tardar el 15 de Noviembre del año en que se solicite.

Art. 3° El registro y la autorización serán válidos por tres años, y podrá revocarse por disposición del Ministerio de Salud Pública, cuando se compruebe que el beneficiado, no ha cumplido con las disposiciones de la Ley sobre la Yodización de la Sal y su reglamento y haya sido sancionado con multas en tres ocasiones anteriores por lo menos.

Art. 4° Todo industrial que produzca sal común, estará obligado a adquirir, instalar y hacer funcionar eficientemente su propia planta de yodización para la sal que elabore, o podrá hacer la yodización a través de cooperativas que para tal fin se constituyan. El Estado procurará, a través de sus instituciones de crédito, dar asistencia técnica y financiera a los pequeños salineros para la yodización de la sal común.

Art. 5° El Ministerio de Salud Pública, con la asesoría del Instituto de Nutrición de Centro América y Panamá (INCAP), fijará las proporciones de la mezcla de sales de yodato de potasio y carbonato de calcio que debe emplearse para la yodización de la sal y hará los análisis para determinar si la sal común ha sido yodada de acuerdo con el Art. 1° de la Ley sobre la Yodización de la Sal.

Art. 6° Los establecimientos que se ocupen de la elaboración de la sal enriquecida con yodo para consumo humano o animal, o su

empleo en Industrias alimenticias, deberán cumplir con las normas generales de higiene que el Ministerio de Salud Pública ha establecido para establecimientos semejantes, particularmente en las secciones de manipulación y almacenamiento.

DE LOS CENTROS DE YODIZACION

Art. 7° No podrá elaborarse, ni empaquetarse o fraccionar la sal enriquecida con yodo para consumo humano o animal, sino en los locales técnicamente aprobados por el Ministerio de Salud Pública.

Art. 8° Las personas interesadas en la fabricación o fraccionamiento de la sal enriquecida con yodo, deberán presentar conjuntamente con su solicitud de funcionamiento, el plano del establecimiento y una descripción detallada de los procesos de elaboración, señalando el origen de la materia prima utilizada.

Art. 9° La limpieza de las máquinas, aparatos y demás útiles de elaboración, así como los medios de envases, de almacenamiento y de transporte, deberá practicarse diariamente.

Art. 10° Las personas, naturales o jurídicas, que figuren como propietarios de las fábricas o establecimientos comerciales que elaboren o fraccionen la sal enriquecida con yodo, son responsables de todo producto que sea entregado a la venta con defectos de elaboración o deficiencias en el envase, para los

efectos de aplicación del Art. 20° del presente reglamento.

DE LOS ENVASES Y ROTULACIONES

Art. 11° Los envases y envoltorios destinados al transporte y expendio, deberán ser nuevos y de primer uso, libres de contaminación y de substancias nocivas, ajustarse al Decreto 222 MEIC del 23 de Septiembre de 1976 publicado en "La Gaceta", Diario Oficial, N° 224, del 2 de Octubre del mismo año, referente a normas sobre etiquetas para productos alimenticios de uso humano y/o animales, y deberán contener además la designación SAL YODADA.

Art. 12° La sal que se distribuya en los lugares de expendio popular, deberá ser empacada en bolsas de polietileno debidamente selladas y rotuladas de conformidad con el Art. precedente. También podrá empacarse sal en sacos de tela, pero éstos llevarán en su interior y para su protección, una bolsa de polietileno de igual capacidad que el saco.

NORMAS TECNICAS

Art. 13° El proceso para yodizar la sal común, consistirá en la adición de una mezcla de yodato de potasio y carbonato de calcio en proporción 1:9 a la sal común, en cantidad tal, que el producto final contenga la proporción máxima de 1 parte de yodo por 20.000 de sal y una proporción mínima de una (1) parte de yodo por 30.000 de sal.

Art. 14° A los productores de sal, se les permitirá vender este artículo sin yodización a las plantas productoras de sal enriquecida, así como también, a las plantas industriales. Igualmente y bajo receta médica, se permitirá la venta de sal no yodada para consumo humano.

Art. 15° En el primer caso, se permitirá la venta, transporte y almacenamiento de sal a granel, desde la planta productora o puerto de entrada, hasta la planta usuario industrial, previo dictámen justificativo de las necesidades del usuario que deberá obtenerse en el Ministerio de Economía, Industria y Comercio. Si a juicio del usuario industrial, éste deseara comprar, transportar y almacenar la sal en sacos u otro tipo de envases, éstos deberán llevar la leyenda "SAL NO YODADA PARA USO INDUSTRIAL".

Art. 16° El Ministerio de Salud Pública, por medio de sus Inspectores Sanitarios o delegados, inspeccionará las plantas para constatar la correcta yodización de la sal común, tomando muestras, tanto en los lugares de yodización, como en los lugares de expendio, para los análisis que realizarán en sus laboratorios.

Art. 17° En caso de establecerse, mediante el análisis de un número suficiente de muestras tomadas de acuerdo con las técnicas establecidas, que una partida de sal en venta no se halla yodizada, o en su caso lo estuviere deficientemente, se procederá al incautamiento de la cantidad total, levantándose acta firmada por el Inspector respectivo y por el propieta-

rio encargado responsable del negocio distribuyéndose copias al establecimiento afectado y al Ministerio de Salud Pública.

Art. 18° Cualquier envase de sal enriquecida con yodo ofrecida en venta al público que no reúna las condiciones establecidas en el Art. 11 del presente Reglamento, será considerada como de producción clandestina y sujetos a decomiso por parte de las autoridades competentes.

Art. 19° El Ministerio de Salud Pública, será la autoridad competente para resolver en definitiva cualquier caso no previsto en este Reglamento, o cualquier duda que surja en la aplicación del Decreto Legislativo N° 1542, del 20 de Febrero de 1969 o del presente Reglamento. Así como para dictar y aplicar las normas técnicas que estime convenientes al país.

Art. 20° Las infracciones o las disposiciones del presente Reglamento serán sancionadas de acuerdo con el Art. 5 de la Ley sobre Yodización de la Sal.

Art. 21° El presente Reglamento comenzará a regir desde el día de su publicación en "LA GACETA", Diario Oficial.

a) Background Data

1) Taken together, the prefeasibility work accomplished to date and the known acceptance of jicaro have encouraged CTAN-INCAP-DIT-INTA to design a pilot testing effort for the development of a jicaro-based low cost blended food for marketing to the target group.* It is believed that jicaro could be produced in cultivated orchards on lands with limited and low-value alternate use.** It is initially and tentatively believed that greater value per research and development (R&D) dollar would be generated from the pilot testing of jicaro - a native plant of known adaptability and acceptance - than from the introduction and development of soybeans or other exotics. To date, there have been no full-fledged economic studies or pilot plant operations. However, the facts - i) that there is regular use of jicaro seed in Nicaragua, ii) that at least one manufacturer of jicaro orchata finds it commercially acceptable*** and iii) that there is an abundance of raw material available - all suggest the desirability of expanding the availability and consumption of jicaro - based food products, by removing the current processing constraint through industrialization.

2) Existing Knowledge (State of the Art)

i) Availability of Jicaro Stock. No extensive survey has yet been made of the precise location of jicaro stands of known density and acceptability. However, it is known to occur in stands of varying density in extensive areas on the Pacific slope and intermountain valleys of western Nicaragua. A recent estimate (by CATASTRO) of more than 100,000 hectares of jicaro appears reasonable. For illustrative purposes, based on actual yields obtained to date, the following calculations

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* In this regard the nutritious pulp and seeds are eaten by cattle; they are sufficiently valuable that, in drought years, cattle raisers gather the pulps for rationing to their herds.

** Soil maps indicate there are at least 60,000 hectares of appropriate land, much of it having sonsoquite (heavy clay) soils.

*** Jicaro is currently marketed, on a limited scale, as a convenience item. It is mixed with rice (about 20% jicaro with 80% rice).

shows the potential annual output from 10,000 hectares of jicaro:

Trees per hectare	100 (range 25-300)
Fruits per tree	300 (range 200-1000)
Seeds per fruit	0.025 lbs. (range 0.01-0.05)
Seeds per tree	7 lbs.
Seeds per hectare	700 lbs.
Seeds per 10,000 hectare	7 million lbs.
Drinks of Orchata de Jicaro per pound of seed	11 drinks
Orchata de Jicaro drink per 10,000 hectare	77 million

ii) Nutritive Value. Based on INCAP analyses,* it is estimated that a drink (8 oz.) of orchata de jicaro, containing 20 grams of jicaro seed and 20 grams of rice plus water, will provide a child under five years with approximately seven grams of protein or 23% of his daily requirement and approximately 180 calories or 13% of his daily requirement. It is believed, therefore, that two drinks per day would provide satisfactory supplementary feedint to assist such children overcome Grades II and III malnutrition. Once recovered, one drink per day would provide a significant supplement to their normal, hopefully improved, diet. One or two drinks per day would also be a valuable supplement for first degree malnourished children to improve their growth, build up their defenses against infection and thus help prevent their falling into second or third degree malnutrition. For pregnant and lactating women, it is estimated that four drinks per day would provide supplementation of 28% of the RDAs for calories and 40% RDA for protein.

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* R. Brenes and R. Bressani, "Evaluación Nutricional del Aceite y de la Torta de Semilla de Jícaro ó Morro", INCAP, 1972.

The INCAP research revealed that the flour prepared from the seed, after oil extraction, contains approximately 10% protein. Amino acid analysis of the protein suggested that the deficient amino acids are lysine and methionine. Tryptophan content was relatively high, suggesting this product to be a rich source of this amino acid. The lysine deficiency was confirmed by biological tests with rats but methionine was found not to be a limiting amino acid. In view of the lysine deficiency, jicaro products should be fortified with lysine to obtain optimum results.

iii) Processing Techniques. The jicaro seed is entwined in a fibrous pulp encased in a hard shell. Seed separation is laborious using traditional shell cutting or breaking methods and water maceration. The entire process from seed separation to final product can be mechanized, using known techniques common to preparation of other oil seed products. Some equipment will have to be specially designed, manufactured and tested to meet the particular requirements of jicaro.

iv) Need for Analyses. A carefully-conceived R&D effort will be conducted as part of this project to determine whether to proceed with the production of and distribution of a food supplement based on jicaro seed. The nature and objectives of the effort are described below along with phasing and implementation aspects.

TABLE I

Plant Design Options Implicit in Gomez Brenes' Flow Charts

1. Feed Stock

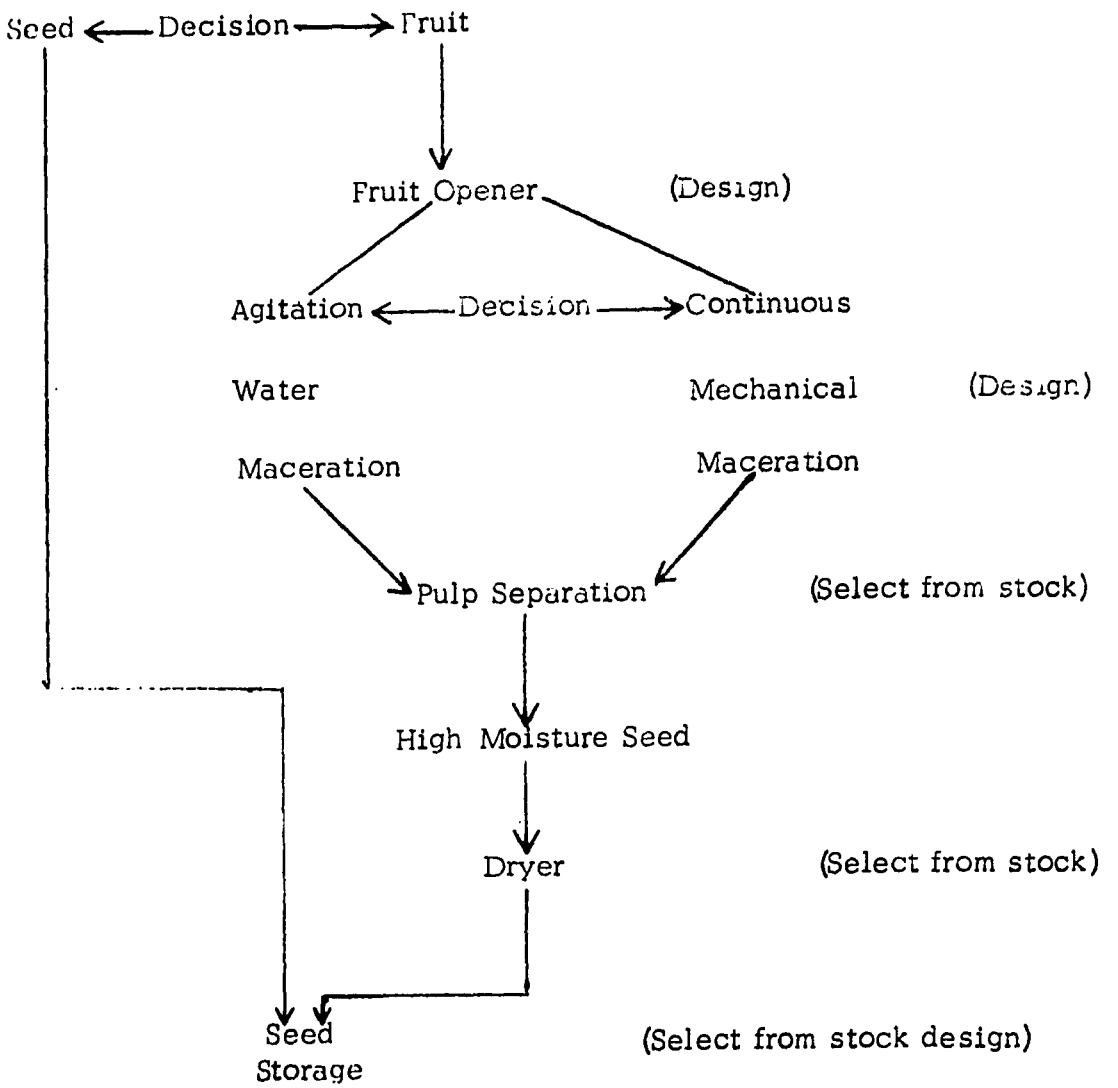
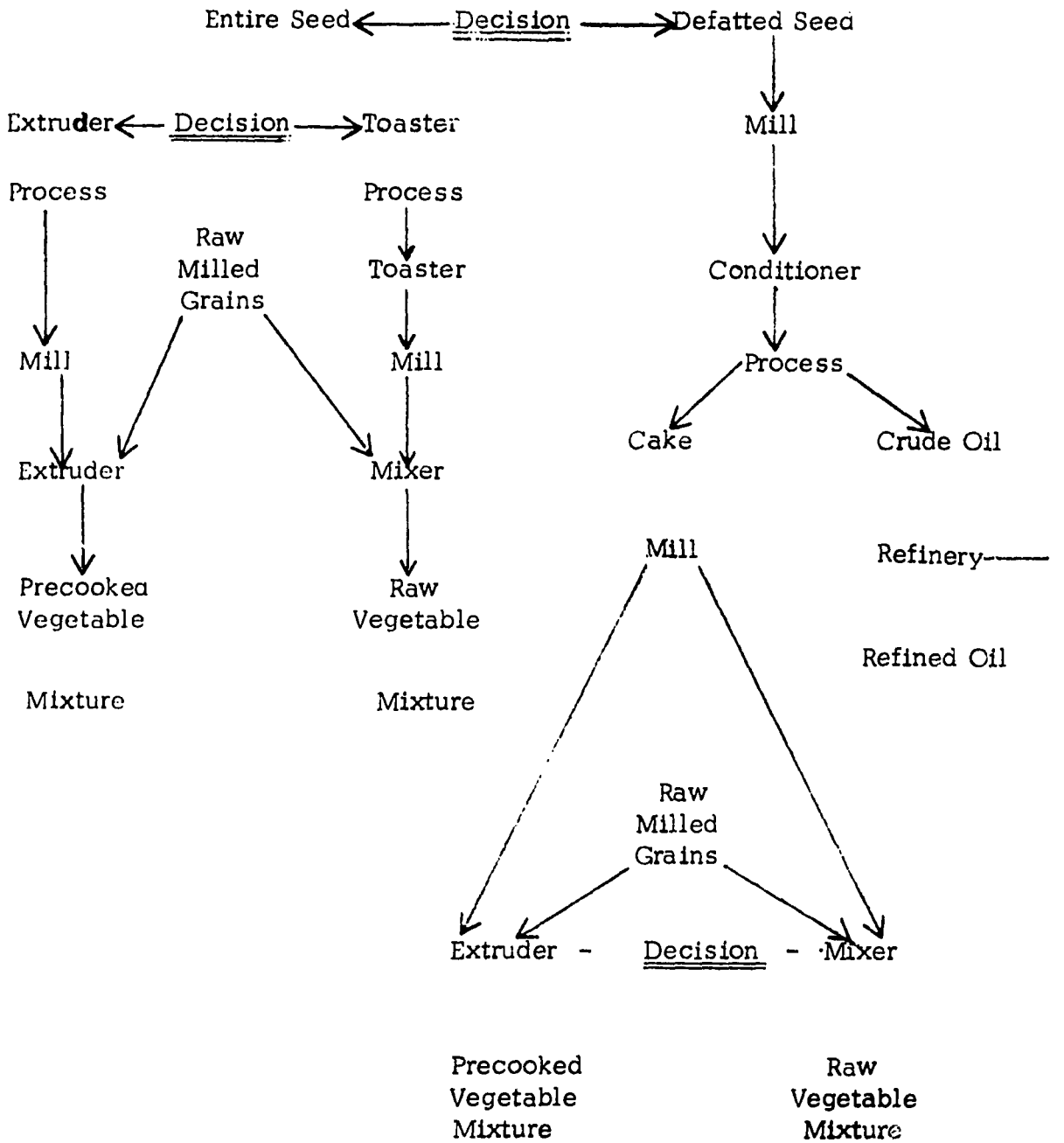


TABLE 2

II. Product Composition



Illustrative Calculations of Jicaro Feasibility

In order to provide an idea of some cost and effectiveness parameters likely to result from the jícaro R&D project,the following calculations were made based on best estimates available and reasonable assumptions. The project will investigate these factors among others. One basic assumption is made here based on estimates provided by CTAN: The pilot plant will be designed to process 1,500 pounds of jícaro seed per day.

1. Seed Production Required to Feed Pilot Plant:

   - 0.025 lbs of seed per fruit
   - 1500 lbs of seed requires 60,000 fruits
   - 365 fruits per tree per year
   - 60,000 fruits per day requires 60,000 tres
   - 100 trees per hectare
   - 60,000 trees requires 600 hectares.

2. Nutritional Impact of Pilot Plant Production:
   For purposes of this analysis it is assumed that the orchata de jícaro blend* is mixed 50% jícaro and 50% rice (20 grams each) and seved in 8 oz "doses". This is the formulation used by INCAP investigators Brenes and Bressani.

   - 1 lb seedprovides 2 lbs blend
   - 2 lbs blend provide 22 doses
   - 1 dose provides 13% calorie RDA and 23% protein RDA for children under 6 years.
   - 2 doses per day required for 2nd and 3rd degree malnourished children.
   - 1/11 lb seed serves 1 child per day.
   - 1,500 lbs seed per day serves 16,500 children per day.
   - 1 dose provides 7% calorie RDA and 10% protein RDA for pregnant and lactating women.
   - 4 doses per day required per woman.
   - 2/11 lb seed serves 1 woman per day.
   - 1,500 lbs seed per day serves 8,250 women per day (1 pregnant or lactating woman = 2 children)

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* Other possible products (e.g. buns, cookies) are not included in these illustrative calculations.

3. Costs per Dose of Orchata de Jícaro

More work must be done to establish firm cost estimates under pilot plant production conditions but the following data gives some idea of the relative magnitudes. Processing costs are not yet known, nor potential value of by-products which would have the effect of reducing total costs.

- C$0.05 paid per fruit to suppliers
- C$0.05 processing cost per fruit
- 1,500 lbs seed requires 60,000 fruits
- 1,500 lbs processed seed costs C$6,000
- 1 lb processed seed costs C$4.00
- 1 lb rice costs C$1.50
- 2 lbs jicaro blend costs C$5.50
- 1 lb jicaro blend costs C$2.75
- 1 lb jicaro blend provides 11 doses
- 1 dose jicaro blend costs C$0.25

BIBLIOGRAPHY

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ii) R. Gómez Brenes, Diseño Preliminar y Comentarios Sobre la Planta Procesadora de Mezclas Vegetales e Industrialización del Jícaro, INCAP Memo Report to CTAN, 1977.

iii) Irma Contreras Mercado, Tecnología para la Separación de Semillas y Evaluación Química - Nutricional de Fruto de Morro (Crescentio Alata), Univ. de San Carlos de Guatemala (CESNA), 1975.

iv) Martha Delgado Cáceres, Estudio de Semilla de Jícaro y Algunas de sus Características, UNAN. Departamento de Química, 1973.

v) Gómez Brenes, Roberto A y Bussari, Ricardo, Evaluación Nutricional del Aceite y de la Torta de la Semilla de Jícaro ó Morro.

vi) INCAP: Archivos Latinoamericanos de Nutrición XXII, No. 2 1973.

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viii) Tejada V., Carlos, La Industrialización del Morro ó Jícaro para Consumo Humano, Carta Informativa INCAP No. 12-76, 1976.

ix) López Miranda, Guillermo, Tesis 1969: Estudio de las Cualidaaes Nutricionales e Industriales del Crescentia Alata H.B.K. en Nicaragua, ENAG, Nicaragua.

ANNEX III E

Detail of Component Three

This Annex contains:

1. Leading Causes or Morbidity and Mortality in the 0 - 5 population.
2. Growth Chart (sample)
3. Timetable for Training Courses to extend Nurrition Services through PRAC[illegible]ANSAR.
4. Extending Nutrition Services in 350 Communities through the Community Anthropometrist.
5. Element I Timetable extending Nutrition Services through PLANSAR/PRACS.
6. Element I A.I.D. Illustrative Budger.
7. Element I GON Illustrative Budget.
8. The parasites most prevalent in the rural areas of Nicaragua are Helminths and Parasitic Amebas.
9. Element II Timetable Anti-Parasite Program.
10. Element II A.I.D. Illustrative Budget.
11. Element II GON Illustrative Budget.
12. Rural Health Facilities.
13. Projections for coverage in the Five Centers Selected in Region V for start-up during the First Year of Project.
14. Projections for coverage in the Five Centers Selected in Region II for start-up during the First Year of Project.
15. Element III Timetable Nutrition Improvement via Health Centers.
16. Element III A.I.D. Illustrative Budget.
17. Element III GON Illustrative Budget.
18. The Requirements of Human Nutrition.

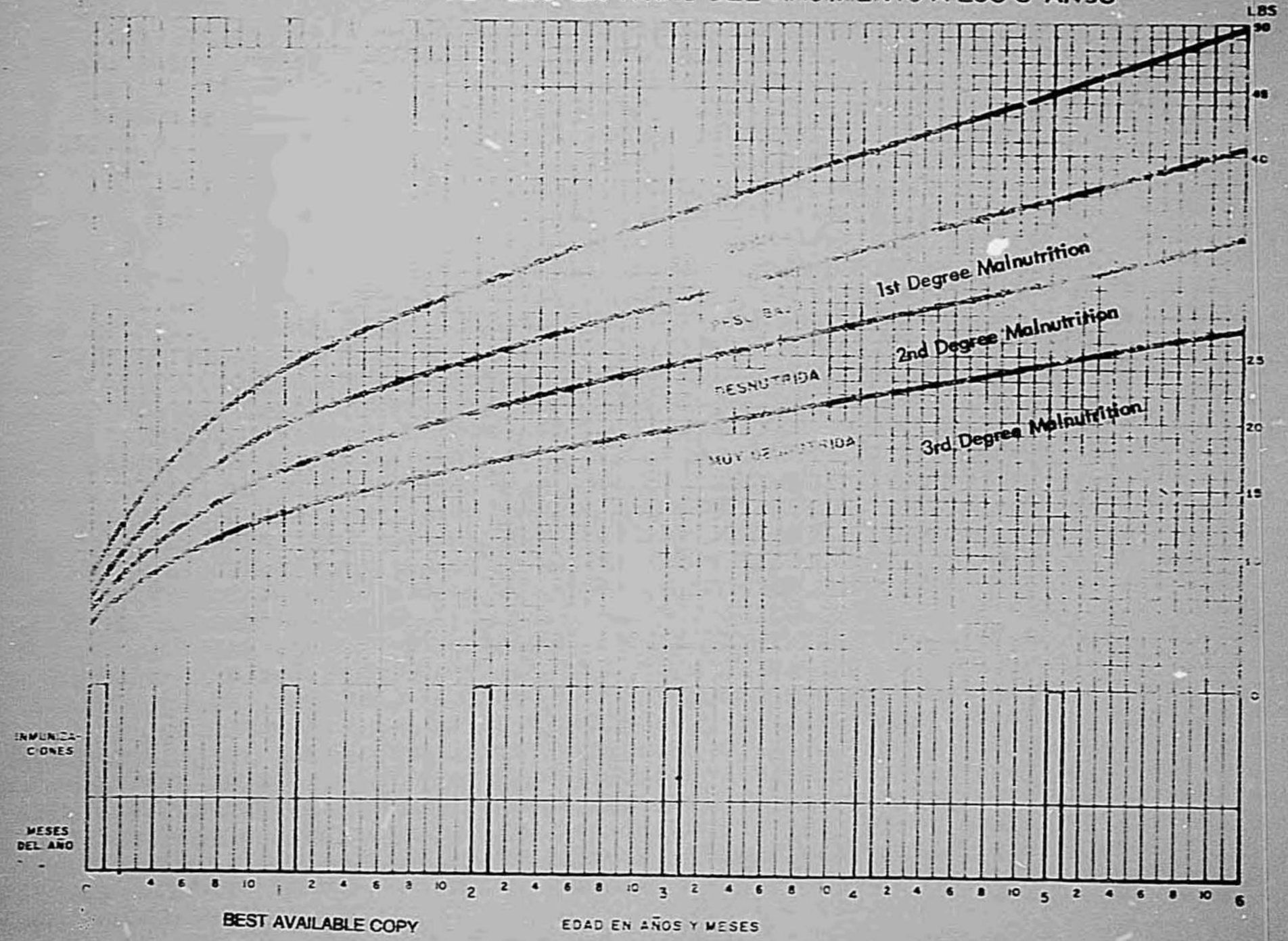
ANNEX III E

Leading Causes of Morbidity and Mortality in the 0-5 Population

MORBIDITY	MORTALITY
1. Diarrheal disease from all causes except bacillary dysentery	1. Enteritis and other diseases causing diarrhea.
2. Bronchitis	2. Perinatal Mortality
3. Influenza	3. Tetanus
4. Bacillary Dysentery	4. Pne umonia, Bronchitis and other respiratory diseases
5. Anemia and other forms of nutritional deficiency	5. Other viral and bacterial infections and parasitic diseases.

(Source: Health Sector Assessment)

CLASIFICACION DE PESO EN NIÑAS DEL NACIMIENTO A LOS 6 AÑOS



TIMETABLE FOR TRAINING COURSES TO EXTEND NUTRITION SERVICES THROUGH PRACS/PLANSAR

KEY:

Health Educator	HE
Anthropometrist	A
Health Collaborator/Anthropometrist	C/A
Refresher Course	RC

All training and refresher course sessions are 1 week in duration with the exception of the refresher course for the anthropometrists which is 3 days in duration. They will be held in rural Nicaragua.

	May-Nov. 1978	Nov.-May 1979	May-Nov. 1979	Nov.1979-May 1980	May 1980-Nov. 1980	Nov.1980-May 1981
Health Educator Training HE	HE-Group 1 (May only)		HE-Group 2 (May only) HE-Group 1 (May only) R.C.		HE-Group 3 (May only) HE-Group 2 (May only) R.C. HE-Group 1 (May only) R.C.	
Anthropometrist Training A	A-Group 1 (3 classes of 10 trainees)	A-Group 2 (9 classes of 10 trainees) A-Group 1 (3 R.C.)	A-Group 3 (3 classes of 10 trainees) A-Group 2 (9 R.C.) A-Group 1 (3 R.C.)	A-Group 4 (9 classes of 10 trainees) A-Group 3 (3 R.C.) A-Group 2 (9 R.C.) A-Group 1 (3 R.C.)	A-Group 5 (3 classes of 10 trainees) A-Group 4 (9 R.C.) A-Group 3 (3 R.C.) A-Group 2 (9 R.C.) A-Group 1 (3 R.C.)	A-Group 6 (8 classes of 10 trainees) A-Group 5 (3 R.C.) A-Group 4 (9 R.C.) A-Group 3 (3 R.C.) A-Group 2 (9 R.C.) A-Group 1 (3 R.C.)
Collaborators and Anthropometrists Training C/A	C/A - Group 1 (3 classes of 20 trainees)	C/A Group 2 (5 classes of 20 trainees) C/A - Group 1 (3 R.C.)	C/A - Group 3 (3 classes of 20 trainees) C/A Group 2 (5 R.C.) C/A Group 1 (3 R.C.)	C/A - Group 4 (5 classes of 20 trainees) C/A - Group 3 (3 R.C.) C/A - Group 2 (5 R.C.) C/A - Group 1 (3 R.C.)	C/A - Group 5 (4 classes of 20 trainees) C/A - Group 4 (5 R.C.) C/A - Group 3 (3 R.C.) C/A - Group 2 (5 R.C.) C/A - Group 1 (3 R.C.)	C/A - Group 6 (5 classes of 20 trainees) C/A - Group 5 (4 R.C.) C/A - Group 4 (5 R.C.) C/A - Group 3 (3 R.C.) C/A - Group 2 (5 R.C.) C/A - Group 1 (3 R.C.)

ANNEX III E

EXTENDING NUTRITION SERVICES IN 350 COMMUNITIES THROUGH THE COMMUNITY ANTHROPOMETRIST

	May 78/ Nov 78	Nov 78/ May 79	May 79/ Nov 79	Nov 79/ May 80	May 80/ Nov 80	Nov 80/ May 81	May 81/ Nov 81	Total
No. of communities	30	90	30	90	30	80	Evaluation	350
No. of anthropometrists trained	30	90	30	90	30	80		350
Total Number of Beneficiaries	2,310	6,930	2,310	6,930	2,310	6,160		26,950
Children 0-1 years of age (4% of population)	420	1,260	420	1,260	420	1,120		4,900
Children 1-5 years of age (18% of population)	1,890	5,670	1,890	5,670	1,890	5,040		22,050

initially trained in

This schedule is designed taking the rainy season into account. Whereas 90 community anthropometrists will be/ the dry seasons, only 30 will be trained during the rainy seasons thus allowing for difficulty associated with transportation/inaccessibility during the rainy season. The approximate number of beneficiaries was determined considering an average of 350 people per community and 22% of the population 0-5 years of age.

ANNEX III E

ELEMENT I

TIMETABLE*

Extending Nutrition Services through PLANSAR/PRACS

Technical Assistance programmed to:	
a) improve nutrition curricula for health educators;	
b) develop curricula for anthropometrists re: usage of growth charts, etc.	January-June, 1978
c) develop joint nutrition curricula for health collaborators and anthropometrists	(See Component I)
Development of teaching materials	January-June, 1978
Order supplies for first 120 communities (scales, tape recorder/radios, tapes, etc.)	January 1978
Training Health Educators (1 class)	May 1978
Training Anthropometrists and Collaborators/ Anthropometrists (6 classes)	May-November, 1978
Training Anthropometrists and Collaborators/ Anthropometrists (20 classes)	November 1978-May 1979
Order supplies for 120 communities	January 1979
Contract for Evaluation T.A.	January 1979
First Evaluation	May 1979
Training Health Educators (2 classes)	May 1979
Training Anthropometrists and Collaborators/ Anthropometrists (26 classes)	May-November 1979
Order supplies for 120 communities	January 1980

*See Annexed Diagram of Timetable for training courses for the Health Educator, Anthropometrist and the Health Collaborators.

ANNEX III E

Training Anthropometrists and Collaborators/ Anthropometrists (40 classes)	November 1979-May 1980
Training Health Educators (3 classes)	May 1980
Training Anthropometrists and Collaborators/ Anthropometrists (47 classes)	May 1980-November 1980
Training Anthropometrists and Collaborators/ Anthropometrists (60 classes)	November 1980-May 1981
Contract for Evaluation T.A.	April 1981
Final Evaluation	By November 1981

ANNEX III E

ELEMENT I

ILLUSTRATIVE BUDGET

A.I.D.

Technical Assistance	
Curriculum Design and Testing Training (2 person months)	See Component I
Evaluation (2 person months)	$ 10,000
Commodities	
355 Salter scales at $40.00 (350 communities and 5 teaching aids)	$ 14,200
Gomez charts in plastic packages 54,000 at $.40 (2 per child)	$ 21,600
Tape recorders/radios - 350 at $100	$ 35,000
Batteries - 350 sets at $2.00	$ 700
Cassette tapes (2 per anthropometrist) at $1.50	$ 1,050
3 Vehicles (Jeep-type) at $8,000	$ 24,000
In-Country Training	
Health Educators - 6 courses x 5 days x 20 persons x $10	$ 6,000
Anthropometrists	
35 courses x 5 days x 10 persons x $5	$ 8,750
Refresher course for anthropometrists - 81courses x 3 days x 10 persons x $5	$ 12,150
Rural Health Collaborators/Anthropometrists	
83 courses x 5 days x 20 persons x $5 (This includes 58 refresher courses)	$ 41,500
Course supplies for training programs	$ 600
Total	$ 175,550

ANNEX III E

ELEMENT I

ILLUSTRATIVE BUDGET

G.O.N.

Vehicle Maintenance	$ 5,600
Gasoline	$ 13,200
Replacement Batteries for tape recorders	$ 4,500
Course costs $40 per course (205 courses)	$ 8,200
Salaries	
GON Faculty/Supervisor (PRACS) (approx. $10,000 per year)	$ 62,000
(1 during first year)	
(2 during second year)	
(3 during third year)	
3 Drivers (approx. 7 person years $2,400 per year)	$ 16,800
Ongoing Evaluation	$ 2,600
Total	$112,900

ANNEX III E

The parasites most prevalent in the rural areas of Nicaragua are helminths and parasitic amebas

Helminths

Name	Common Name	Portal of Entry	Clinical Symptoms	Source of Infection	Lab Diagnosis
Ascaris Lumbricoides	Large Roundworm	Mouth	Vague Abdominal Distress	Eggs from soil or vegetables	Stool
Trichuris Trichiura	Whipworm, Threadworm,	Mouth	Abdominal discomfort, anemia, bloody stools	Eggs from soil or vegetables	Stool
Strongyloides Stercoralis	Cochin (China diarrhea)	Skin	abdominal discomfort, diarrhea	Larva in soil	Stool
Various Species	Hookworm (or Ancylostomiasis)	Skin	itching, anemia	eggs from soil or the nutritional deficiency type	Stool

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Amebas

1) Entamoeba coli

2) Endolimax rana

3) Entamoeba Histolytica (Amebiasis)

Source: MOH

ANNEX III E

ELEMENT II

TIMETABLE

Anti-Parasite Program

Select GON health professional to be responsible for curriculum training and supervision of this project	January-May 1978
Select health educators, collaborators and nurses to be trained regarding mass distribution of parasite medication	
Order Supplies (vehicles, drugs, educational materials in coordination with CTAN)	ASAP after loan is signed
Short-term training of Health Educators (2 classes)	May 1978-November 1978
Short-term training of Rural Health Nurses (1 class)	May 1978-November 1978
Short-term training of collaborators (4 classes)	November 1978-May 1979
Order more supplies	January 1979
First Annual Evaluation of Anti-parasite program	May 1979
Training of Health Educators (4 classes)	May-November 1979
Training of Rural Health Nurses (2 classes)	May-November 1979
Training of Rural Health Collaborators (6 classes)	May 1979 - May 1980
Order more supplies	January 1980
Second Evaluation of Anti-parasite program	May 1980
Training of Health Educators (6 classes)	May 1980-November 1980
Training of Rural Health Nurses (4 classes)	May 1980-November 1980
Training of Collaborators (8 classes)	May 1980 - May 1981
Third Annual Evaluation of Anti-parasite program	May 1981

ANNEX III E

ELEMENT II

ILLUSTRATIVE BUDGET

A.I.D.

Technical Assistance	
Curriculum Design and Testing Training Methodology (4 person months)	See Component I
Design/Evaluation of Distribution/Control of Drugs (CDC or other) (3 person months)	$ 15,000
Commodities	
Drugs: 1. Mebendazole (Approx. $.12 per tablet)	$ 118,280
2. Moisture proof boxes for storage at the village level (at approx. $2.50 ea.) (Tupperware type)	$ 890
Records, files for workers. (.10 per beneficiary)	$ 8,600
One Vehicle (Jeep-type)	$ 8,000
In-Country Training	
Special training in intestinal parasites and gastro-enteritis and the specific responsibilities associated with the massive distribution program.	
Per diem	
Health educators: 60 educators will attend approximately 12 classes (10 educators x 2 days x 12 classes x $10)	$ 2,400
Rural Health Collaborators: 120 collaborators will attend approximately 18 classes (15 collaborators x 18 classes x 2 days x $6)	$ 3,240
Rural Health Nurses: 45 Rural Health Nurses will attend approximately 7 classes (10 nurses x 5 classes x 3 days x $10 &15 nurses x 2 classes x 3 days x $10)	$ 2,400
One PRACS faculty full time will teach approximately 37 short courses during the project.	970
	$ 159,780

ELEMENT II

ILLUSTRATIVE BUDGET

G.O.N.

Storage and Handling of Drugs Including Delivery Costs to pick-up points for Health Educators/ Collaborators	$ 2,000
Vehicle Maintenance (5% cost of vehicle 1st year, 15% 2nd year, 25% 3rd year)	$ 3,600
Gasoline	$ 6,700
Training Centers Maintenance Costs (use of PLANSAR/ PRACS (or MOH) facilities).	$ 1,000
Course Costs (reproduction, etc.) for 37 courses at approximately $40 per course	$ 1,480
Salary of Faculty/Supervisor from MOH (3 years)	$ 31,000
Salary of Chauffeur (3 years)	$ 6,200
Evaluation: Data Collection, Analysis and Review (3 person months) (MOH Department of Epidemiology)	$ 2,600
Total	$ 54,580

ANNEX III E

RURAL HEALTH FACILITIES

This annex lists the MOH Health Centers and MOH Health Posts in Regions V and II excluding 11 Health Centers in the Department of Managua from which will be chosen the final mix of health facilities which will offer extended nutrition-related health services.

REGION V - CENTRAL INTERIOR

Health Centers	Department
Estelí	Estelí
La Trinidad	
Condega	
San Juan de Limay	
Pueblo Nuevo	
Jinotega	Jinotega
San Rafael del Norte	
Yali	
La Concordia	
Matagalpa	Matagalpa
Matiguás	
Ciudad Darío	
San Dionisio	
Sébaco	
San Isidro	
Esquipulas	
Terrabona	
Rio Blanco	

REGION V TOTAL 18

REGION II - CENTRAL PACIFIC

Health Centers	Department
Jinotepe	Carazo
Diriamba	
San Marcos	
Santa Teresa	
La Conquista	
Masaya No.1	Masaya
Masaya No.2	
Catarina	
La Concepción	
Masatepe	
Niquinohomo	
Tisma	
Nindiri	
La Paz de Oriente	
Granada No.1	Granada
Granada No.2	
Diria	
Nandaime	
Diriomo	

REGION II TOTAL 19

Region V: Health Posts. Health Posts are under the management of PUMAR. MOH physicians visit them only periodically as they "ride the circuit".

HEALTH POSTS MATAGALPA CIRCUIT

Carretera	San Ramon	Sabana Grande
Samulali	Yasica	La Concordia
Susuli	Chaguitillo	San Marcos
San Marcos de Venecia		

REGION V TOTAL: 10

REGION II:

HEALTH POSTS GRANADA CIRCUIT

La Paz	San Gregorio
Dulce Nombre	Veracruz
Cofradías	Pio XII
Valle de la Laguna	El Escudo
La Orilla	Los Cocos

REGION II TOTAL 10

ANNEX III E

PROJECTIONS FOR COVERAGE IN THE FIVE CENTERS SELECTED IN REGION V FOR STARTUP DURING THE FIRST YEAR OF PROJECT

Estimated Population	1978	1979	1980
Estimated Growth (Growth Rate 3%)	44,364	45,656	47,066
Population 1 (4%)	1,775	1,826	1,883
% Coverage Programmed	40%	50%	60%
Number Covered	710	913	1,130
Pre-School Population (1-5 yrs) (18%)	7,986	8,218	8,472
% Coverage Planned	20%	30%	40%
Number Covered	1,597	2,465	3,389
Number of Pregnant Women	2,039	2,101	2,165
% Coverage Planned	30%	40%	50%
Number Covered	612	840	1,083
Post-Natal/Lactating Women % Coverage (% of pre-Natals followed post-natally)	50%	50%	50%
% of Total No. Pregnant Women	15%	20%	25%
Number Coverage	306	420	541
No. Total MARP Covered	2,919	4,218	5,602

ANNEX III E

PROJECTIONS FOR COVERAGE OF MARP IN FIVE CENTERS SELECTED IN REGION II FOR STARTUP DURING THE FIRST YEAR OF PROJECT

Estimated Population	1978	1979	1980
(Growth Rate) 3%	36,715	37,815	38,949
Population 1 (4%)	1,568	1,513	1,558
% Coverage Programmed	40%	50%	60%
Number Covered	587	756	935
Population Pre-School (1-5 yrs) (18%)	6,609	6,807	7,011
% Coverage Planned	20%	30%	40%
Number Covered	1,322	2,042	2,804
Number of Pregnant Women	1,689	1,739	1,791
Number Coverage Planned	30%	40%	50%
Number Covered	507	696	895
Post-Natal/Lactating % Coverage (% of Pre-Natals followed post-natally)	50%	50%	50%
% of Total No. Pregnant Women	15%	20%	25%
Number Covered	254	348	448
Number Total MARP Covered	2,416	3,494	4,634

ANNEX III E

ELEMENT III

TIMETABLE

Nutrition Improvement Via Health Centers

	Description	Tentative Dates
a.	Technical assistance programmed for experts for training health workers re: Nutritional Impact of MCH services. (nurses and laboratory technicians).	As soon as Loan is signed
b.	Project Managers designated by MOH, final determination of 1st group of 10 health centers to be improved (in conjunction with Institute of Human Resources in Health), orders placed for selected equipment based on detailed survey of needs.	January, 1978
c.	Nutrition "sensitization" training initiated for Group #1 (first ten centers) of primary health care workers and supervisors with CTAN technical cooperation.	February-March, 1978
d.	Plans initiated for programming nutrition related rural health clinical experience for National Health Delivery School.	April, 1978
e.	Health professionals in initial 10 centers to incorporate improved nutrition interventions/education in their clinical services.	March - August, 1978
f.	Training initiated for 1st group of laboratory technicians.	July - August, 1978
g.	Initial equipment and supplies (medicines,etc.) delivered to 10 rural health centers.	July - August, 1978
h.	Final determination of 2nd group of 15 health centers or posts to be improved (in conjunction with the Institute), orders placed for equipment and supplies for 2nd group of 15 centers. (The order is determined after review of several months of operations of 1st ten centers).	December, 1978
i.	Training of Group 2 health workers.	February - March, 1979

	Description	Tentative Dates
j.	Health professionals in 2nd group of centers begin to incorporate improved nutrition interventions/education in their clinical services.	March - July, 1979
k.	Final determination of 3rd group of 20 health centers and orders placed for equipment and supplies.	April, 1979
l.	Training initiated for 2nd group of laboratory technicians.	July - August, 1979
m.	Equipment and supplies arrive for Group 2 Centers.	July, 1979
n.	Training for Group 3 Centers.	October-November, 1979
o.	Health professionals in 3rd group of centers begin to incorporate improved nutrition interventions/education in their clinical services.	November, 1979-January, 1980
p.	Orders arrive and are installed in 3rd group of 20 centers or posts.	January, 1980

ANNEX III E

ELEMENT III

ILLUSTRATIVE BUDGET

A.I.D.

Technical Assistance	
Curriculum Design and Testing Curriculum (2 person months)	See Component I
Nursing Supervision Consultant to demonstrate clinic management procedures for nutrition impact and evaluation (3 months)	$ 15,000
Rural Laboratory Technician Instructor and follow-up evaluation (3 months)	$ 15,000
Design/Evaluation of Drug Supply and Control System (3 months)	$ 15,000
Trainer in Use of Small Business Computer (1 month)	$ 5,000
In-Country In-service Training	
45 Rural Health Nurses/Auxilliaries (including 4 courses and 10 refresher courses) (10 trained in first year, 15 in second year and 20 in third year)	$ 6,000
Faculty Per Diem	$ 1,000
20 Rural Laboratory Technicians (2 three months courses and 8 one week refresher courses at $430 per month for each trainee)	$ 34,500
Faculty Per Diem	$ 5,720
Commodities	
Health Center/Post Supplies	
Gomez Weight Charts and Plastic Covers ($.40 ea. 800 children per clinic, 2 charts per child)	$ 28,800
45 Portable Stoves (propane gas) at approx. $80 ea.	$ 3,600

45 Scales (adult) at approximately $150 ea.	$ 6,750
45 Scales (baby) at approximately $40 ea.	$ 1,800
45 Sets of demonstration equipment for super-limonada preparation or other simple food demonstration at $20 ea.	$ 900
45 Tape Recorder/radios at $100	$ 4,500
225 Cassette Tapes at $1.50	$ 338
Initial Batteries for Tape Recorders	$ 90
30 Gas Refrigerators at $500	$ 15,000
45 Blackboards at $25 ea.	$ 1,125
Other supplies for Record Keeping (notebooks, pens, etc.) 45 x $50	$ 2,250
Vehicles, Jeep-type, 5 at $8,000	$ 40,000
Drugs *	$ 250,000
Supplies for Training	
Nutrition books, films, subscription to journals for the National Health Delivery School (NHDS) (copies for both campuses) $1,000 per school per year	$ 8,000
Nutrition teaching supplies for NHDS (two campuses) (stoves, scales (baby, adult, salter, etc.) and miscellaneous equipment/supplies	$ 1,900
3 Slide Projectors	$ 450
3 Screens	$ 100
Slides to demonstrate a) clinical signs of malnutrition (and manual) and b) microscopic views of parasites (and manual)	$ 350
20 Microscopes at approximately $500 (to be used in the Health Centers after training)	$ 10,000

*See tentative list on following page

Microscope Slides and Training Supplies	$ 500
Drug Supply System	
1 Small Business Computer to Control Drug Inventory and Distribution	$ 15,000
Associated equipment and file cabinet with lock for reports/shelves	$ 1,000
Total	$489,673

DRUGS*

Multivitamin and Mineral Tablets with 1 mg. Folic Acid, Prenatal

Multivitamin and Sodium Fluoride Solution (for children)

Mebendazole

Metronidazol

Piperazine

Piperazine (liquid for children)

Multivitamin Suspension Oral (for children)

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*The mix of drugs needed on a clinic specific basis will be determined as the clinics are identified.

ANNEX III E

ELEMENT III

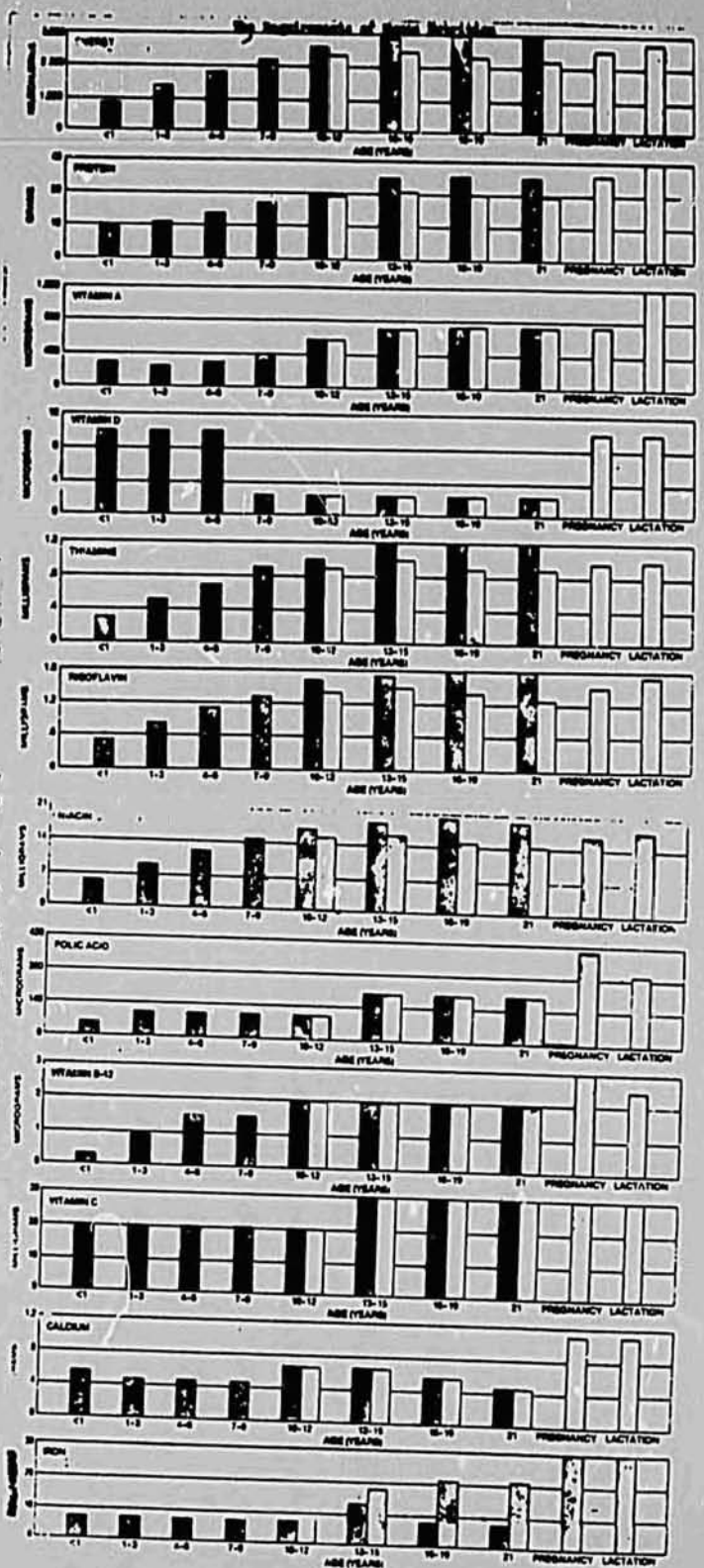
G.O.N.

ILLUSTRATIVE BUDGET

	1978-79 (January-May)	1979-80 (May-May)	1980-81 (May-May)
Commodities			
Gasoline	6,600	8,800	11,000
Vehicle Maintenance	1,200	4,000	7,600
Fuel for Stoves, Refrigerators	1,200	3,000	5,400
Replacement Batteries for Tape Recorders	220	570	1,040
Laboratory Supplies ($50 per month)	6,000	12,000	12,000
Drugs		125,000	125,000
Training Costs			
Rural Laboratory Technologists ($250 per month of class)	750	1,000	250
Rural Health Nurses ($100 per week of class)	200	400	800
Salaries			
Contracted Nurse Supervisors (1 visit per mo. at $10 a day, 2 persons indicated in 3rd year)	1,200	3,000	5,000
Drivers (4 at $175 per mo. during first 2 yrs., 5 during 3rd year)	8,400	8,400	10,500
Rural Health Laboratory Technologists	51,450	102,900	102,900
Laboratory Field Supervision (28 months of supervision)	6,250	5,900	7,865
Manager of Medicine Supplies	10,000	10,000	10,000

	1978-79 (January-May)	1979-80 (May-May)	1980-81 (May-May)
Support Services			
Laboratory Support Services (50.00 per lab. per mo. collection from central la. of specimens (blood and stool)	6,000	12,000	12,000
Collection of data analysis of data, report to CTAN	500	800	1,000
Handling Costs for all drugs used in program (transport-ation, storage and distri-bution to centers/posts)	2,000	2,500	3,000
TOTAL	$101,970	$300,270	$315,355

GRAND TOTAL: $717,595.00



RECOMMENDED DAILY ALLOWANCES for energy, protein and selected vitamins and minerals shown here were agreed on by an FAO-WHO expert committee in 1974. Requirements vary markedly with age, and those of males (left bar where two bars are together) are significantly different from those of females (right bar where two bars are together). Pregnancy and lactation also increase nutritional needs. Recommended allowances are not absolute for individuals; they can be justifiably applied only to reasonably healthy populations and may well be subject to revision as knowledge advances.*

* Sarlashaw, Nevin and Young, Vernon, "The Requirements of Human Nutrition", Scientific American, September 1976.

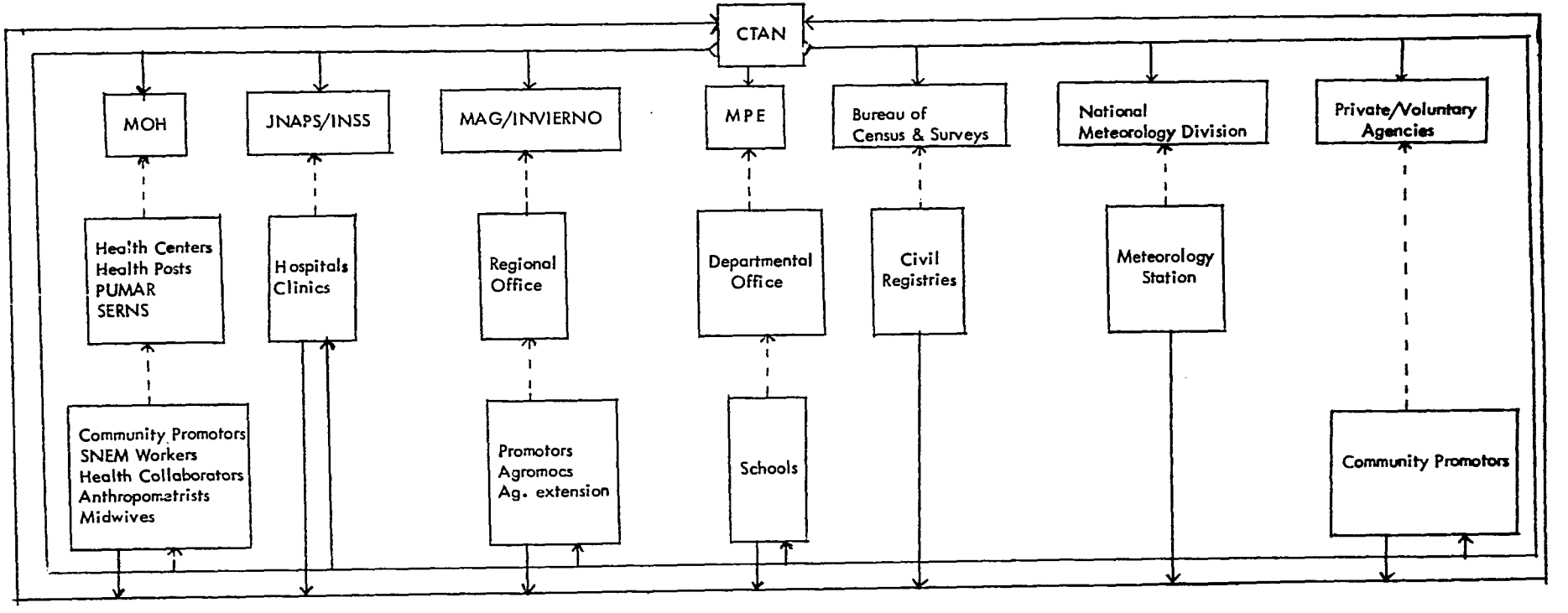
ANNEX III F

Detail of Component Four

This Annex Contains:

1. Flow Diagram of the NEIS.
2. The Nutrition Evaluation and Information System (NEIS).
3. Illustrative Breakdown of GON and A.I.D. Inputs and Budget for Component IV.
4. Article: "Panel Calls for Global Food and Nutrition Research Drive".
5. Source of Funds.

Flow Diagram of the NEIS



---------- Existing data flow

_____ NEIS data flow

THE NUTRITION EVALUATION AND INFORMATION SYSTEM (NEIS)

1. Baseline Data

The NEIS will require reliable baseline information concerning the incidence and severity of malnutrition. The 1966 INCAP national survey, while the most extensive and representative data available, is limited in its practical application since the survey was carried out eleven (11) years ago and only in urban and peri-urban areas surrounding 30 communities of more than 500 inhabitants, and in Managua. The several studies conducted since 1966, which were directed at the measurement of rural malnutrition, are limited in the nature and representativeness of the data collected. Nutrition planners in Nicaragua are aware of the importance of obtaining reliable and up-to-date baseline data and of the need to use this information to: a) inform national-level decision-makers in the various sectors of the importance of using nutritional status as one of the criteria of program success; b) select priority areas, in both a geographic and socio-economic sense; and c) quantify the impact of programs/projects on nutritional status. For these reasons, CTAN has assigned a high priority to the design, development and implementation of a national nutrition survey.

Work on this survey is well-advanced. Questionnaire design was completed in March, 1977 and a pilot survey was conducted in April in Regions II and V sampling 368 families. On the basis of experience with the field testing of the survey instrument, the final questionnaire has been designed, a representative national sample of approximately 3,000 households has been chosen, and preparations are underway to field the survey in August, 1977. Data will be obtained in the survey concerning:

a) the size and structure of the household;
b) nutritional status of all children under five years of age;
c) household income during the past year;
d) seasonal fluctuations in household income;
e) housing conditions;
f) type of water supply and means of waste disposal;
g) mortality and morbidity;
h) access to and types of health services utilized;
i) food habits and where food is produced or purchased;
j) educational levels;
k) beliefs, practices and taboos including food practices and types of health and medical attention during pregnancy, childbirth and lactation; and
l) status of immunization against communicable disease.

A set of social welfare and other indicators will be selected based on the analysis of the baseline data provided by the national survey. The indicators will include: a) direct and indirect indicators of nutritional status (e.g. anthropometric measurements, infant mortality trends) to be used as retrospective measures of program success or failure and to alert planners and decision-makers to priority areas for future program development; and b) prospective indicators related to the basic determinants of nutritional status and to delivery of basic services. Examples of the former are changes in food prices and cost of living information which will alert planners and decision-makers to potential future nutritional problems. Examples of the latter are coverage of potable water and environmental sanitation services and basic health services, information which will permit analysis of effectiveness of those services in conjunction with the use of data on nutritional status for the population groups covered.

II. Data Flow

This system component includes the mechanism for data reporting, collection and delivery, processing, analysis, and feedback into each sector.

The mechanism for data collection will rely on the existing infrastructure of public and private sector sources which include: health posts, health centers, hospitals, mobile health units (PUMAR), the civil registries, the agricultural extension service of the Ministry of Agriculture, INCEI, school teachers, meteorological stations and others. Perhaps the most valuable sources of information will be collected at the community level from indigenous midwives as well as promotors working through such public and private institutions as INVIERNO, PRACS, PLANSAR, DENACAL, PROVADENIC, CARITAS, and others. These community-based workers would be responsible for providing some nutrition education to the community, for monthly weighing of children under five years of age and for collecting nutrition-related data to be fed into the national system.

At the present time, it is planned that approximately 10 government institutions will be linked up to the national system. Involvement of private institutions in the system will be phased, in conjunction with their participation at the community level under Component I. There will be an estimated total of 304 government data collection points in the entire country, with the following regional breakdown: Region V = 65; Region II = 93; and the remaining six (6) regions = 146. In Region V, for which plans are most advanced, the estimated 65 government collection sites will consist of: 20 schools; 3 hospitals; 18 health centers, health posts and SERNs; 6 agricultural

extension posts and 18 sites including meteorological stations and civil registries. Data will also be collected by anthropometrists in approximately 200 communities in Region V(not considered government collection sites). It is likely that the number of community level collection points in the NEIS may increase as the public and private institutions expand their coverage in communities.

The data to be provided by each source will depend on: a) an analysis of the data currently being reported through the various institutions; b) a determination as to what data relating to nutritional status could be reported without placing a strain on their existing data collection system; and c) an analysis of the role these institutions play or could play, in combatting malnutrition. Data already collected, which is relevant to the nutrition problem, will be delineated, and complementary data which the institutions could provide in the future will be specified.

CTAN in collaboration with the individual participating institutions, will redesign the institution's data forms and procedures to permit linkage of the system with the national nutrition system. In order to facilitate ease of removal of the nutrition-related information needed by CTAN, such information will be entered on duplicate forms that can be physically removed for delivery to the CTAN office. Remittance of data forms will follow as closely as possible the set-up of a referral system, with community-level data being delivered periodically to the nearest health center or post, for pick-up by CTAN personnel (in order to avoid the uncertainties of the mail system). Once at CTAN, the data will be transferred to magnetic tapes for computer analysis and permanent storage (for use in subsequent analysis). The analyzed data will be compared to the pre-established indicators (e.g., infant mortality, percentage of third degree malnutrition). Reports based on the analysis will be prepared by CTAN and distributed to various divisions of the participating institutions. Special reports may be prepared dealing with specific problems or regions.

The system must feed information back into both the project design and implementation process in order to effect the changes necessary for continual improvement of the planning and managerial aspects of program design and implementation. Information obtained through the data collection component of the system must be tabulated, analyzed and interpreted and the results and recommendations as they pertain to various planning, programming and implementing activities reported back to those institutions responsible for carrying out the activities including the communities themselves. The format for delivering feedback information to operating agencies will be in the form of a Food and Nutrition Newsletter. Health

educators and other agents working with the community will transmit the feedback information to the community, discuss its implication for the community and facilitate local planning and decision-making to respond to the data's implications.

Several types of analyses are envisaged using the data which will be entered into permanent storage in the National Nutrition Data Bank. The first will consist of the preparation of the set of indicators. These indicators will serve as the basis for a set of recurring reports to be produced by the CTAN staff and circulated to the participating institutions on a regular basis and summarized in the Food and Nutrition Newsletter. The national data bank information will also be used to focus on specific problem regions or districts, especially those under consideration for program development. In addition, the data bank can be used to provide information pertaining to the nutritional situation in areas which will be affected by projects planned by CTAN.

CTAN has already begun the process of identifying data needs and determining which of the national institutions might logically provide the necessary information. CTAN staff members have obtained copies of all of the data forms currently used by the institutions that are likely to be linked up in the national system and have examined the content of nutrition-related data of value for inclusion in the national system. Current activity in the CTAN includes the identification of a set of indicators to be prepared for the NEIS. Once this list is complete, it will be possible to specify the data needed to measure these indicators on a recurring basis. Comparison of this set of data needs with that currently collected will enable determination of the additional data needed to integrate into the system.

At the same time, CTAN and the participating institutions will examine the current data collection procedures in order to identify areas in which the procedures can be improved. This effect will be followed by the specification of the types of training required for the central and field level personnel of the various institutions.

III. Training and Supervision

In order to ensure the full cooperation and collaboration of participating institutions, CTAN will conduct a total of thirty-eight (38) "motivational" seminars for personnel at different levels in the institutions and communities during the life of the project. Each seminar will involve approximately twenty-five (25) individuals plus CTAN members. The topics will include: a) significance and value of the

NEIS; b) examination of how projects and policies from various sectors can impact on nutritional status; c) explanation of the National Nutrition Data Bank and feedback system; d) practical training on how to analyze, interpret, and use the data generated by the NEIS in planning and designing projects in the individual sectors. Three such seminars are planned to be held in October of this year, using 1976 grant funds, prior to implementation of the system in Region V in 1978.

In addition, to further stress to planners the importance of including nutritional goals into their overall planning, and provide these people (and CTAN members) with the necessary tools and knowledge to carry out "nutrition planning", a special training course will be offered dealing with Basic Nutrition, Applied Nutrition, and Project Design and Management. Although the total time devoted to this training course will be about six weeks, the training will be spread over a period of six months to allow trainees to feedback experience gained in project operations. External training programs similar to the one now being developed in Colombia will contribute to further practical experience in such areas as "nutritional surveillance", community level planning, etc.

It is also essential that the central and field level personnel who are involved in data collection systems in the participating institutions be trained in the proper methods and procedures of data reporting and collection for the NEIS. Prior to system implementation, CTAN will train a group of 15 individuals for one week in data reporting and collection procedures. These trained individuals will then spend approximately four (4) days each at one data collection point to provide on-site field training. In this way, fifteen (15) trainers could cover about sixty (60) sites in three (3) weeks. It is estimated that a total of 826 individuals in the entire country will be trained in NEIS data collection and reporting procedures. Preparation of the training methods will be in collaboration with the personnel responsible for operation of the system in the different institutions.

A carefully designed and controlled system of supervision and evaluation of the system's operations is planned to ensure accurate reporting and collection of data. Regional and municipal level personnel will be trained to supervise field operations on a monthly basis. Supervisory visits to data collection points by central level personnel will be made every three months. A four (4) week internal evaluation of the operation of the entire system is planned each year after the system has been operating in a region for six (6) months. Field or institutional level personnel involved in the operation of the system, who are hired after the system is underway, will be trained by central level supervisors.

IV. System Implementation

The first months of system operation must be viewed as a test run, during which the CTAN will work out a smoothly operating system for collection of the data from the various institutions. A preliminary design of this system is being worked out at the present time. To overcome the considerable delays inherent in a system where data must flow from diverse collection points to regional and/or central levels, the CTAN collection system will rely on tear-sheet forms from the primary collection points. The system will be implemented through the use of a small number of collection personnel who will traverse a predetermined route according to a predetermined schedule.

Once the data has "physically" arrived at the CTAN office, there must be a smoothly functioning set of procedures for transferring the data to computer cards and, after verification, onto permanent magnetic computer tapes for analysis and storage in the NEIS data bank. The CTAN is investigating computer facility alternatives.

V. System Validity

In order to ensure that data, especially health data, collected from participating agencies is representative of the population group served by the agency and accurately reflects changes in the nutritional situation in the entire community, two methods will be employed, one ongoing and one periodic.

As a check on the representativeness of morbidity and nutritional status data provided by health centers, the same type of data obtained from community sources will be compared. If, for example, malnutrition rates reported by centers deviate significantly from data from the surrounding communities, planners will conclude that center data is not reliable for program planning purposes because the centers do not service a representative sample of the population.

As a check on both sources, focused area-specific sample surveys will be conducted periodically in selected locations. The survey will be undertaken by CTAN and will collect data similar to that collected and reported by the agencies. The data derived from this statistically stratified random sampling process will then be compared with the data derived from the various agencies in the geographical area. These periodic sample surveys will cover various indicators besides morbidity and nutritional status.

Special check surveys may be undertaken to determine the validity and probable causality of any major changes (positive or negative) in indicators in a community or region.

Considerable care will be taken in the collection, handling and analysis of data to assure that it is correctly aggregated and interpreted.

Illustrative Breakdown of GON and A.I.D. Inputs and Budget for Component Four

Key: L = Loan

	A.I.D.					GON				
	1978	1979	1980	1981	TOTAL	1978	1979	1980	1981	TOTAL
a). NEIS										
1. Motivational Seminars for institutions involved in the NEIS										
A. High Level Officials										
30 people, 1 day										
- perdiem ($20/person)						600				600
- materials and room rental						100				100
B. Program Directors										
32 people, 1 day, 3 seminars total										
- participant's salaries ($24/day)						800	800	800		2,400
- perdiem ($12/day/person)						400	400	400		1,200
- materials and room rental	100	100	100		300					
- secretarial service and reproduction of reports						100	100	100		300
C. Heads of Divisions										
32 people, 2 days,										
6 seminars total										
- participant's salaries ($20/day)						2,400	2,400	2,400		7,200
- perdiem ($12/day/person)						1,500	1,500	1,500		4,500
- materials and room rental	100	100	100		300					
- secretarial service and reproduction of reports						100	100	100		300
D. Regional Seminars (Alcaldes, etc.)										
33 people, 2 days, 6 seminars total	(1 seminar)	(2 seminars)	(3 seminars)							
- perdiem ($10/day/person)	700	1,400	2,100		4,200					

	A.I.D.					GON				
	1978	1979	1980	1981	TOTAL	1978	1979	1980	1981	TOTAL
- materials and room rental	100	200	300		600					
- secretarial service and reproduction of reports						100	100	100		300
E. Local Personnel										
33 people, 2 days, 9 seminars total	(2 seminars)	(4 seminars)	(3 seminars)							
- perdiem ($10/day/person)	1,400	2,800	2,100		6,300					
- materials and room rental	200	400	300		900					
- secretarial services and reproduction of reports						100	100	100		300
F. Community Level										
33 people, 2 days, 10 seminars total	(3 seminars)	(4 seminars)	(3 seminars)							
- perdiem ($10/day/person)	2,000	2,700	2,000		6,700					
- materials and room rental	100	100	100		300					
2. In-service training (4 days)										
- salaries of personnel, 87 people trained in Region V in 1978; 267 people trained in Regions II and IV in 1979; 372 people in other Regions in 1980. (Avge Salary $6/day)						2,100	6,500	9,000		17,600
- salaries and perdiem of 25-trainers ($17/day) 348 p. days in 1978; 1,068 p. days in 1979; 1,488 p. days in 1980.	6,300	19,300	26,800		52,400					
- training manuals						200				200
3. Equipment										
- 450 scales at $35 each	15,800				15,800					
- 150 height boards at $35 each	5,200				5,200					

	A.I.D.					GON				
	1978	1979	1980	1981	TOTAL	1978	1979	1980	1981	TOTAL
- 102 additional scales/height boards for additional communities to be incorporated in the NEIS.							3,600	3,600		7,200
4. Data Collection										
A. Field personnel salaries (5% of their time). Avge. salary is $172/month 1978: 87 people 1979: 87 + 267 = 354 people 1980: 354 + 372 = 726 people						9,000	36,500	75,000		120,500
B. Printing of data collecting forms for the different agencies for first year	50,000(L)				50,000					
C. 3 vehicles for data pick-up	7,000(L)	7,000(L)	7,000(L)		21,000					
D. Gas (150 mi. per day at 10 mi/gal $1/gal, 180 days/year/vehicle)						2,700	5,400	8,100		16,200
E. Vehicle maintenance (30% of gas costs)						900	1,800	2,700		5,400
F. Drivers' salaries ($200/month each)						2,400	4,800	7,200		14,400
5. Data processing ($2,000/month)	24,000(L)	20,000(L)	12,000(L)		56,000		4,000	12,000		16,000
6. Periodic Surveys (questionnaires, surveys)	2,100	4,200	4,200		10,500	1,500	4,300	3,600		9,400
7. Technical Assistance (4 p.m.)	14,000	10,000			24,000					

	A.I.D.					GON				
	1978	1979	1980	1981	TOTAL	1978	1979	1980	1981	TOTAL
8. Training Course in "Nutrition Planning" (25 people, about 36 days)										
- professor's salary (TA)	10,000				10,000					
- students' perdiem ($20)						18,000				18,000
- materials and room						400				400
b). Policy research, Technical assistance and related costs	13,000	13,000(L)	12,000(L)		38,000	10,000	10,000			20,000
c) External Training	25,000(L)	25,000(L)	25,000(L)	25,000(L)	100,000	5,000	5,000	5,000	5,000	20,000
Sub-Total GRANT	70,800	40,400	39,300		150,500	58,400	87,400	131,700	5,000	282,500
LOAN	106,300	65,900	54,800	25,000	252,000					
11. 11% inflation/contingency (Loan)					28,000					
TOTAL					430,500					282,500

Panel Calls for Global Food and Nutrition Research Drive

A combination of intensified agricultural research and "political will" could result in elimination of the worst aspects of the world food problem by the end of this century, according to a report released on 23 June by the National Research Council (NRC) of the National Academy of Sciences.

The report—"World food and nutrition study: the potential contributions of research"—was ordered by President Ford after the 1974 World Food Conference. But its recommendations, particularly those which would put the Department of Agriculture (USDA) in a pivotal international role vis-à-vis world agriculture and nutrition, are receiving high level attention from this Administration, and are clearly more consonant with the initiatives taking shape under President Carter than with the policies of his predecessors.

The report is definitely a creature of the 1970's. It pulls away from the moonshot mentality embedded in the Green Revolution, recognizing instead that obstacles raised by politics, population, and poverty have to be overcome if increased production is to make a dent on the food problem. It puts heavy emphasis on the need for nutrition research and points out that affluent countries have their own brand of malnutrition. It calls for developing lines of research—such as nitrogen fixation, genetic manipulation, and efficiency of photosynthesis—that will make minimum energy demands. The report also reinforces the new dogma of the '70's that research will have to be designed to be appropriate to local needs, and calls for more social science and behavioral research as part of the overall program.

The panel, headed by Harrison Brown of the California Institute of Technology, states that food production in developing countries will have to be doubled by the end of the century. Very little of this increase will come from putting new land under cultivation, said Brown at a press conference announcing the report; rather, it will come from increased yields and better food preservation.

The panel made it clear that the United States has to take the leadership in broadening and speeding up international food and nutrition research. First priority, therefore, is improvement in U.S. agricultural research, a pan-governmental effort involving in particular the Agency for International Development, the National Science Foundation, and the National Institutes of Health, as well as USDA.

The report says AID money to developing countries for research should be tripled from the current level of $30 million per year. It wants NIH to reorient its nutrition research toward problems of more relevance to developing countries, and suggests a heavier commitment by NSF to nutrition and related social and behavioral research.

As for USDA, the report echoes recommendations that have frequently been made in the past, to wit: the department needs an undersecretary devoted solely to research; more basic research is needed; a new competitive grants program on food and nutrition research is needed; and more research money should be made available to universities and private research institutions outside the land-grant system. An immediate increase of $120 million a year for research is called for.

The recommended shifts in priorities are all in line with the report's contention: "In our view, the Secretary of Agriculture speaks not just for the interest of American food producers but also for the broader interests of all American citizens in a world moving to alleviate hunger and malnutrition."

The USDA, under the leadership of Secretary Robert Bergland, is clearly more amenable to these changes than it was in the Earl Butz days. "We largely concur with what is in this report," says James Nielson, the new deputy assistant secretary for conservation, research, and education. In fact, the report as a whole feeds right into current Administration thinking on what to do about world food. It contains a "very good set of recommendations," according to Gilbert Omenn of the Office of Science and Technology Policy, and is "getting the highest possible level of review" in the Executive Office of the President. Omenn observes that the Administration has already made some moves along the lines proposed in the report—it has, for example, asked Congress to appropriate $27.6 million for a competitive grants program in USDA that would focus on research on nitrogen fixation, photosynthesis, and genetic manipulation.

The report lists 22 areas of high-priority research, putting special emphasis on investigations likely to produce workable results in the near future. Included are such categories as management of tropical soils (where annual production might be raised up to 200 percent); beefing up aquatic food sources (with more efficient processing, fish protein available for human consumption could be doubled without increasing the present world catch); and research on the implications for nutrition of general government policies.

Says the report: "If there is the political will in this country and abroad . . . it should be possible to overcome the worst aspects of widespread hunger and malnutrition in one generation." That is a big "if." The members of the panel can at least find some justification for their optimism in the fact their report is being read.—C.H.

Science Magazine, July 8, 1977

SOURCE OF FUNDS
(In US$000)

Key: (L) Loan Funds
(G) Grant Funds

Uses of Funds	A.I.D. 1978	1979	1980	1981	Total for AID	G O N 1978	1979	1980	1981	Total for GON	Grand Total
1. Element I											
NEIS Operating Costs											
a. Seminars	4.7	7.8	7.1		19.6	6.2	5.5	5.5		17.2	36.8
b. Training	6.3	19.3	26.8		52.4	2.3	6.5	9.0		17.8	70.2
c. Equipment	21.0	-	-		21	-	3.6	3.6		7.2	28.2
d. Data Collection	57.0(L)	7.0(L)	7.0(L)		71(L)	15.0	48.5	93.0		156.5	227.5
e. Computer Processing of Data	24.0(L)	20.0(L)	12.0(L)		56(L)		4.0	12.0		16.0	72.0
f. Surveys	2.1	4.2	4.2		10.5	1.5	4.3	3.6		9.4	19.9
g. Course in Nutrition Planning	10.0	-	-		10.0	18.4	-	-		18.4	28.4
h. Technical Assistance	14.0	10	-		24.0	-	-	-		-	24.0
2. Element II Policy Research T.A. and Related Costs	13	13(L)	12(L)		38(G/L)	10	10	-		20	58
3. Element III Training	25(L)	25(L)	25(L)	25(L)	100(L)	5	5	5	5	20	120
Annual Totals	177.1	106.3	94.1	25	402.5	58.4	87.4	131.7	5	282.5	685

	A.I.D. Loan	A.I.D. Grant	GON
	252	150.5	282.5
11% Inflation/Contingency	28		
Total	280		

DETAIL OF FINANCIAL ANALYSIS

This Annex contains:

1. GON Budget.

2. MOH Budget.

3. Proposed CTAN Budget.

4. Proposed CTAN Personnel Costs.

Summary Budget Allocation Government of Nicaragua
000's of Cordobas (US$1.00 - C$7.00)

	1974		1975		1976		1977	
	Amount	Per Cent	Amount	Per Cent	Amount	Per Cent	Amount	Per Cent
Legislative Branch	12,217	0.7	14,455	0.8	21,615	1.0	28,322	1.2
Presidence-Gov. Council-Army Chiefs Dept.	32,128	1.9	31,769	1.7	29,356	1.3	49,861	2.1
Government	88,454	5.2	122,016	6.5	144,647	6.5	202,132	8.3
Public Relations	22,143	1.3	23,193	1.2	26,397	1.2	28,853	1.2
Finance	447,470	26.2	378,597	20.1	392,668	17.6	241,095	9.9
Education	245,251	14.3	257,840	13.7	353,184	15.8	347,910	14.3
Public Works	217,234	12.7	240,293	12.8	230.940	10.4	345,004	14.2
Defense	111,682	6.5	140,285	7.5	172,951	7.8	204,134	8.4
PUBLIC HEALTH	166,983	9.8	189,763	10.1	187,778	8.4	202,279	8.3
Economy, Industry & Commerce	93,848	5.5	98,860	5.2	108,385	4.9	97,816	4.0
Agriculture	60,508	3.5	62,264	3.3	133,557	6.1	173,430	7.2
Labor	13,094	0.8	18,862	1.0	21,745	1.0	17,663	0.7
Controller General	6,753	0.4	8,326	0.4	8,720	0.4	8,890	0.4
Executive Power	1,505,548	88.1	1,572,068	83.5	1,810,328	81.4	1,919,067	79.0
Judicial Branch	10,588	0.6	12,472	0.7	15,009	0.7	14,596	0.6
Electoral Branch	12,125	0.7	15,612	0.8	13,740	0.6	26,572	1.1
Interest	86,453	5.0	135,739	7.2	182,014	8.2	210,633	8.7
Principal	83,463	4.9	131,552	7.0	180,457	8.1	228,377	9.4
Public Debt	169,916	9.9	267,291	14.2	362,471	16.3	439,010	18.1
TOTAL:	1,710,394	100.0	1,881,898	100.0	2,223,163	100.0	2,427,567	100.0
As a Percent of Total								
Recurring Costs	40.5%		44.6%		48.3%		48.6%	
Capital Expenditures	43.4%		36.4%		33.7%		30.0%	
Grants & Misc. Donations	15.9%		17.9%		16.8%		20.0%	
Funds for Specific Purposes	0.2%		1.1%		1.2%		1.4%	

Source: GON's Revenue and Expenditure Budgets.

ANNEX IV A
Exhibit 2

COMPARATIVE MOH BUDGET 1974/1977 BY PROGRAMS
000's OF CORDOBAS (US$1.00 = C$7.00)

	1974			1975			1976			1977			Total Average Percentages
	Amount	% 1/	% 2/	Amount	% 1/	% 2/	Amount	% 1/	% 2/	Amount	% 1/	% 2/	
A. Central Administration	3,800		10.0	4,059		7.7	6,367		10.2	6,991		8.8	9.2
B. Promotion and Health Protection	19,009		49.4	26,313		50.0	31,363		50.1	38,320		48.0	49.4
C. Special Health Services	2,891		7.6	5,189		9.9	4,540		7.2	4,565		5.7	7.6
D. Medical Attention Services	12,683		33.0	17,025		32.4	20,335		32.5	22,292		28.0	31.5
E. Rural Health Services	-			-			-			7,575		9.5	2.3
Direct Program Budgets	38,441	23.0	100.0	52,586	27.7	100.0	62,605	33.3	100.0	79,743	39.4	100.0	100.0
F. Administration - DENACAL	1,991			2,099			2,099			2,099			
G. Public Works Investment Projects	67,142			58,874			41,585			19,266			
Current and Capital Budgets 3/	107,574	64.4		113,559	59.8		106,289	56.6		101,108	50.0		
H. Transfers to Private Institutions	1,005			1,005			708			534			
I. Transfer to Public and Decentralized Institutions	42,355			68,753			67,830			76,580			
J. Cuotas to Regional Institutions	-			946			951			1,020			
K. Capital Transfers to JNAPS	16,049			5,500			12,000			11,000			
L. Capital Transfers to Empresa Aguadora de Managua	-			-						12,037			
Indirect 4/	59,409	35.6	100.0	76.204	40.2		81,489	43.4		101,171	50.0		
Total MOH	166,983	100.0		189,763	100.0		187,778	100.0		202,279	100.0		

NOTES

1/ As a percent of total MOH Budget
2/ As a percent of Direct Program Budget
3/ Sub-total represents MOH current and capital expenditures budget. See Annex 4 for Object Class Breakdown
4/ Sub-total represents MOH subsidies

SOURCE: GON's Revenue and Expenditure Budgets

ANNEX IV A
EXHIBIT 3

ESTIMATED CTAN BUDGET 1978 - 1981 ($000)

	1978	1979	1980	1981	TOTAL
Salaries (Maximum) [1]	260	261	287	316	1124
Salaries (Probable)	(195)	(196)	(215)	(237)	(843)
Materials and Supplies [2]	7	8	8	9	32
Office Machines and Other Equipment (Maximum)	43	7	7	7	64
Office Machines and Other Equip (Probable)	(30)	-	(7)	-	(37)
Other Operating Expenses [2]	136	150	165	182	633
Total(Maximum)	446	426	467	514	1853
Total (Probable)	(368)	(354)	(395)	(428)	(1545)

[1] All personnel costs list on Exhibit 4, Annex IV A whether directly from CTAN budget or from other MOH sources are included. Most of the non-CTAN salary support comes from other portions of the MOH budget. Temporary or part-time CTAN representatives from other GON agencies are not included in the above figures.

[2] Assume 10% annual cost increase

UNCLASSIFIED
ANNEX IV A
Exhibit 4

CTAN Personnel Cost Projections Based on FY 78 CTAN Budget Request (In U. S. Dollars)

	1978			1979			1980			1981			TOTAL		
Position	CTAN Salary	CTAN Bonus Salary	Other GON Funding	CTAN Salary	CTAN Bonus Salary	Other GON Funding	CTAN Salary	CTAN Bonus Salary	Other GON Funding	CTAN Salary	CTAN Bonus Salary	Other GON Funding	CTAN Salary	CTAN Bonus Salary	Other GON Funding
Director	10,286	6,857	17,143	11,315	7,543	18,857	12,446	8,297	20,743	13,691	9,127	22,817	47,738	31,824	79,560
Chief Nutrition Planner	9,429	3,429	-	10,372	3,772	-	11,409	4,149	-	12,550	4,564	-	43,760	15,914	-
Chief Nutritional Medicine	6,000	-	10,286	6,600	-	11,315	7,260	-	12,446	7,986	-	13,690	27,846	-	47,737
Chief-Public Relations	6,857	-	-	7,543	-	-	8,297	-	-	9,127	-	-	31,824	-	-
Anthropologist/ Sociologist	8,571	-	-	9,428	-	-	10,371	-	-	11,408	-	-	39,778	-	-
Nutritionist	8,571	-	-	9,428	-	-	10,371	-	-	11,408	-	-	39,778	-	-
Nutritionist	8,571	-	-	9,428	-	-	10,371	-	-	11,408	-	-	39,778	-	-
Economist	8,571	-	-	9,428	-	-	10,371	-	-	11,408	-	-	39,778	-	-
Food Technologist	9,429	3,429	-	-	-	-	-	-	-	-	-	-	-	-	-
Industrial Eng.	9,429	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Agro Engineer	8,571	-	-	9,428	-	-	10,371	-	-	11,408	-	-	39,778	-	-
Registered Nurse	3,086	-	-	3,395	-	-	3,734	-	-	4,107	-	-	14,322	-	-
Administrator	8,571	-	-	9,428	-	-	10,371	-	-	11,408	-	-	39,778	-	-
Accountant (2)	6,857	-	-	7,543	-	-	8,297	-	-	9,127	-	-	31,824	-	-
Bilingual Secretary	3,429	2,571	-	3,772	2,828	-	4,149	3,111	-	4,564	3,422	-	15,914	11,932	-
Secretary (4)	11,040	-	-	12,144	-	-	13,358	-	-	14,694	-	-	51,236	-	-
Bilingual Receptionist	3,171	-	-	3,488	-	-	3,837	-	-	4,221	-	-	14,717	-	-
Illustrator	3,429	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chie -Surveillance System	-	6,000	6,857	-	6,600	7,543	-	7,260	8,297	-	7,986	9,127	-	27,846	31,824
Chief-Nutrition Education	-	5,143	7,714	-	5,657	8,485	-	6,223	9,334	-	6,845	10,267	-	23,868	35,800
Chief Applied Nutrition	-	6,857	4,714	-	7,543	5,185	-	8,297	5,704	-	9,237	6,274	-	31,824	21,877
Chief Projects & Evaluation	-	8,571	-	-	9,428	-	-	10,371	-	-	11,408	-	-	39,778	-
Health & Nutrition Specialist	-	4,286	-	-	4,715	-	-	5,186	-	-	5,705	-	-	19,892	-
Legal Advisor	-	3,429	8,571	-	3,772	9,428	-	4,149	10,371	-	4,564	11,408	-	15,914	39,778
Watchman (3)	5,657	-	-	6,223	-	-	6,845	-	-	7,529	-	-	26,254	-	-
Maintenance Personnel (2)	2,057	-	-	2,263	-	-	2,489	-	-	2,738	-	-	9,547	-	-
Chauffeurs (8)	12,343	-	-	13,577	-	-	14,935	-	-	16,428	-	-	57,283	-	-
Sub-Total	153,925	50,572	55,285	148,574	51,857	60,814	163,431	57,043	66,895	179,774	62,747	73,584	645,704	222,219	256,578
Annual Total		259,782			261,245			287,369			316,105			1,124,501	

Economic Analysis

Specific Considerations of Cost-Effectiveness

a. Nutrition Education. Component One of the program will support the development and execution of a three pronged approach to nutrition education of the target families i) formal (school) education, ii) non-formal education through promoters and extension workers and eventually through the whole array of persons that influence the target group (INCEI) agents, pharmacists, etc.) and iii) the mass media nutrition campaigns. These channels are expected to provide 30%, 15% and 80% of target group coverage, respectively.* Since a limited number of simple but essential messages will address the most important food and health habit areas** - and the same contents will be incorporated in all three education approaches - considerable reinforcement will occur. Rather than each form of education resulting in a specific outcome (quantified change in practices), the repetition-reinforcement of the three different forms, taken together, is expected to make a greater collective impact on the community than the total impact of each separately. That is, a promoter's visit will demonstrate implementation of an improved food habit taught to a child in school and to a parent via radio spots. This will permit broad coverage of the target families so that specific interventions are responded to more positively by the entire family unit. The burden of change will thus not be placed on only one family member. The higher costs of person-to-person nutrition education may thereby be used more efficiently and with greater coverage, since fewer visits will be necessary to bring about the desirable changes in food habits.

Within Nicaragua's integrated rural development program, extension workers (e.g., PRACS health educators, INVIERNO social promoters) are already in-place with administrative and logistic support. Two forms of cost effectiveness result from the three-pronged integration of nutrition into the overall program. First, start-up costs for a new cadre of promoters working only in nutrition are avoided. Second,

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* Estimated in Theroux report (see Annex II E).

** As indicated in Part Three, some 15-20 messages will be delivered of which 7-8 are already prepared.

the reinforcement of promoters with nutrition messages via radio and school curriculum will result in an overall increase in the efficiency with which nutrition education is delivered to the target group by: i) reducing the time diverted from other rural development tasks that the promoters are responsible for; ii) actually increasing minimum coverage (radio) to that portion of the target group residing in areas that are inaccessible to promoters; and iii) ensuring longer-term, institutional (primary school) coverage for the target group.

b. Subsidized Feeding Alternatives. As discussed by Reutlinger and Selowsky*, food subsidies can be in the form of general price subsidies, food supplement deliveries, income transfers, or food stamps. Experience in Nicaragua has been limited to food distribution in the form of MCH, school feeding and food for work programs, as well as emergency, disaster-related food distribution. The analysis of the Caritas and World Food Programs for food distribution (see Part II B of this paper and consultant's evaluation report) indicated that the various food supplements imported (including PL-480 Title II) for free distribution were sufficient to cover 50% of the caloric and 28% of the protein requirements of 62% of the vulnerable groups for calendar year 1975. However, the assorted problems of delivering food, including "leakage" to poor but not "most-at-risk" groups, food deterioration, logistics, diversion and unfamiliarity on the part of target groups, led to a coverage with sufficient nutritive value of only 6% of the vulnerable groups (only partial coverage estimated for 37,000 of the MARP within a total number of CRS and WFP recipients of around 100,000). Comparing this 6% actual with 62% potential coverage of the MARP in 1975 (acknowledging that some of the difference includes the general rural poor family target group), Nicaraguan experience with PL-480 Title II assistance would indicate an efficiency rate of less than 10% for the food distribution alternative, assuming no improvement in management. The 1975 value of food imports for these programs was around $787,000. To this is added the cost of delivery (transport, storage, administration) which is estimated to be at least 11% of the value of the food for rural areas of most nutritional interest. Thus:

i. Cost of reaching 37,000 MARP candidates:
1.11 x $787,000 = 873,570 or $24 each.

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* In Malnutrition and Poverty, World Bank Occasional Paper No. 23.

ii. Hypothetical cost of reaching estimated 600,000 total MARP = $14,400,000 annually for supplements. *

Feeding benefits cease, of course, as soon as the food supplements run out, and future costs to the government would rise with the population under such an alternative, at least in the medium development term. Though food supplements were used in Nicaragua to attract mothers to nutrition education and other activities, the benefit of such activities are not included in the above illustration, since the historic public cost of conducting such activities is now known.

The Reutlinger and Selowsky analysis concludes that a general price subsidy is probably more cost-effective than a direct target-group oriented food distribution program in cases where the poor target group is a large percentage of the total population (as in the case in Nicaragua). Food stamp and direct income transfer programs are briefly analyzed in their paper. The conclusion is that income transfer is less cost-effective, since not all of the income increment is consumed as food** A food stamp program - used in the U.S. (albeit controversially) and being initiated in Colombia with A.I.D. support - may be cost-effective when the cost differential supported by the stamps is in accord with food preferences, and especially if stamps are sold at different costs for different income levels.*** The possible constraint exists too that the individual may not have enough cash to even purchase the stamps. In the case of Nicaragua, food stamps would involve a set of significant start-up and administration costs, since the private sector commercial-distribution system has never been subject to government subsidy type programs.

In this regard, Reutlinger and Selowsky note (p. 39) "that many target group oriented programs and subsidies (e.g., food price subsidy, food stamp program,

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* Such an annual cost of reach is hypotehtical because it is actually out-of-reach in Nicaragua.

** The additional unit of food delivered to the target group by a direct income transfer depends on the group's marginal propensity to consume (as well as consumption preferences, including non-food preferences.)

*** This, of course, is administratively difficult.

straight-forward income transfer) are almost impossible to institutionalize in a rural environment". The Component Two effort to develop a low cost blended food product to benefit the target group (especially rural) thus comprises a carefully designed R & D activity. It is anticipated that the government subsidy for the vegetable blend will be provided mainly at the research stage and through the initial production/distribution and promotion/education stages.* The cost of actual commercial production and distribution is then expected to be borne by the public. The general price subsidy will thus represent a small and diminishing part of the total cost (assuming success with this project activity). Taken together, the projection of low fiscal burden and the potential for broad target group coverage are significant enough for the USAID to conclude - as do Reutlinger and Selowsky about general food price subsidies - that selection of this R & D project activity, from among other possible interventions in Nicaragua, is warranted as a promising, cost-effective method for increasing the availability of nutritious food to the undernourished in general and the MARP in particular.

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* There is considerable debate over how much a government - or other agency not motivated by profit - should finance (or subsidize) R & D efforts. In theory, it should push its contribution to the point where the expected marginal social benefit equals the social benefit in alternative uses, but this is obviously a very difficult thing to measure. (Probably the most interesting attempt to measure the social rate of return from R & D is Grilliches' early study, which concludes that the social rate of return from investment in agricultural research has been very high.) The assumption underlying program R & D efforts is that too little is currently being spent here in comparison with potential social benefits.

INITIAL ENVIRONMENTAL EXAMINATION

Project Location	Nicaragua
Project Title:	Nutrition Improvement Program
Funding (Fiscal Year and Amount: ($500,000 grant/$3.0 million loan.	FY 1977 - FY 1981
Life of Project:	4 Years (3 Year Grant - 4 Year Loan)
IEE Prepared By:	Lawrence Odle Assistant Capital Development Officer

Environmental Action Recommended: It is recommended that this program receive a negative determination and that no additional environmental examinations be carried out in respect to it. The program will involve a four phased approach to the improvement of the nutritional well-being of Nicaragua's rural poor. The four components will consist of: 1) improving food habits, 2) increasing food availability, 3) extending maternal and child health (MCH) services and food utilization, and 4) evaluating nutritional impact. On the basis of our appraisal and review of the activities contemplated under the program, we believe that, given its emphasis on training, research, and technical assistance, it is not a major federal action which will have a significant adverse effect on the environment.

Concurrence by Mission Director:

Arthur W. Mudge, Director, USAID/Nicaragua

Date: 8-10-77

Assistant Administrator Decision:

Approved: _____
Abelardo L. Valdez, AA/LA

Disapproved: _____
Abelardo L. Valdez, AA/LA

Project Description.

This proposed nutrition loan/grant is one in a series of four (4) A.I.D. financed integrated rural development projects in Regions II and V in Nicaragua. The project is designed to complement the three previously approved rural loans in health, education, and farm credit. The object of this proposed loan is to improve the nutritional well being of the rural poor, first in Region V and then in Region II, with primary emphasis on a target group of children up to the age of five and pregnant or lactating women as well as low-income families in the rural sector. The program consists of four components each one focusing on a different nutritional problem. The four components are: 1) Improving Food Habits, 2) Increasing Food Availability, 3) Extending MCH Services and 4) Evaluating Nutritional Impact. The outcome of this program if successful, will be to improve nutritional status by reducing the incidence and prevalence of malnutrition among the target group.

It is realized that this project will produce certain environmental impacts caused by a hoped for increased in protein and caloric intake by the target population. The nutrition education and maternal child health activities will include advice and assistance on family planning to the target group in order to avoid program-induced increases in the rate of population growth. If the project objectives are to be attained, it is known that more food must be produced and/or be available for rural consumption. On the other hand, healthier, stronger farmers may have a greater potential for producing or transporting more than the needed increases in food caused by the design of the project.

1. Identification and Evaluation of Environmental Impacts

Impact Areas and Sub-Areas:	Impact Identification and Evaluation 2/
A. Land Use	
1. Changing the character of land through:	
a. Increasing the Population	L
b. Extracting Natural Resources	L
c. Land Clearing	L
d. Changing Soil Productive Capacity	L
2. Altering Natural Defenses	L
3. Foreclosing Important Use	L
4. Jeopardizing Man or His Works	L
5. Other Factors	U
B. Water Quality	
1. Physical State of Water	L
2. Chemical and Biological States	L
3. Ecological Balance	L
4. Other Factors	U
C. Atmospheric	
1. Air Additives	N
2. Air Pollution	N
3. Noise Pollution	N
4. Other Factors	U

2/ N = No environmental impact
L = Little environmental impact
M = Moderate environmental impact
H = High environmental impact
U = Unknown environmental impact

Impact Areas and Sub-Areas:		Impact Identification and Evaluation
D.	Natural Resources	
1.	Diversion, Altered Use of Water	L
2.	Irreversible, Inefficient Commitments	N
3.	Other Factors	U
E.	Cultural	
1.	Altering Physical Symbols	L
2.	Change of Cultural Traditions	M
3.	Other Factors	U
F.	Socio-Economic	
1.	Changes in Economic/Employment Patterns	M
2.	Changes in Population	L
3.	Changes in Cultural Patterns	L
4.	Other Changes in Traditional Agriculture Cultivation Practices	L
G.	Health	
1.	Changing a Natural Environment	N
2.	Eliminating an Ecosystem Element	N
3.	Other Factors - Changing Dietary - Habit of Rural Families	M
H.	General	
1.	International Impacts	N
2.	Controversial Impacts	N
3.	Larger Program Impacts	L
4.	Other Factors	U
I.	Other Possible Impacts	
	(not listed above)	U

ANNEX IV D

POPULATION IMPACT STATEMENT

In March 1977, the World Health Organization (WHO) technical discussions on the "Importance of National and International Food and Nutrition Policies for Health Development" considered the relationship of nutrition and fertility.* WHO studies indicate that family planning is not universally recognized as being relevant to nutrition. There, is however, abundant scientific evidence that demonstrates the impact of family planning on nutritional status. Too many closely-spaced and ill-timed pregnancies are important causes of maternal and child malnutrition.

Just as conventional nutrition measures such as supplementary feeding and nutrition education are important, so are other related activities having nutritional impact like control of infections, management of diarrhea by oral rehydration, and birth spacing. Improved child spacing is encouraged in the Nutrition Improvement Program and, if achieved, should be reflected in morbidity and mortality statistics.

The need to include this focus in the program is evident when one considers the effects of the demographic structure of the population. In Nicaragua, approximately 21% of the population are women in the child bearing years from 14-45 years of age, 22% are 0-5 years and 47% of the population is less t han 15 years old.** An estimated population growth rate of 3.4% for the decade and a doubling of the population in 21 years assuming the growth rate is constant will dilute the positive effects of all attempts at integrated rural development.

The importance of fertility/nutrition/health linkages is stressed in the context of the program's outputs through such mechanisms as primary school education, mass media (radio), rural health center MCH/FP programs, and various community based activities such as the use of tape cassettes.

CTAN's NEIS includes fertility as a determinant of nutritional status. In its role as a disseminator of nutrition-related information CTAN will look at the fertility question as it relates to nutrition (analysis of NEIS data, etc.) and encourage all nutrition "change agents" to communicate this basic knowledge to the target group.

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* Technical Discussions, Thirtieth World Health Assembly, World Health Organization, March 21, 1977

** Health Sector Assessment, 1976.

ANNEX V A

ORGANIGRAMA COMISION INTERSECTORIAL PARA LA ALIMENTACION Y NUTRICION (CIPAN)