



PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS

PART II

ENTITY: DEVELOPMENT SUPPORT BUREAU

PROJECT: NUTRITIONAL PLANNING SYSTEMS FOR INTERNATIONAL AGRICULTURAL CENTERS

PROJECT NUMBER: 931-1124.14

Authorization is given in the amount of \$1,800,000 to finance the activities covered under the project entitled "Nutritional Planning Systems for International Agricultural Centers". These funds will provide for a three year project beginning in FY 1979 and ending in FY 1981.

The Research and Development Committee approved this activity on August 17, 1978.

Signature: *T. Babb acting*  
AA/DS

Date: 11.28.78

Clearances:

DS/N, I.Hornstein	<u><i>IH</i></u>	Date: <u>10/26/78</u>
DS/N, M.J. Forman	<u><i>MJ Forman</i></u>	Date: <u>10/26/78</u>
DS/AGR, D.Peterson	<u><i>D.P. Peterson</i></u>	Date: <u>10/26/78</u>
DS/PO, R.Simpson	<u><i>R Simpson</i></u>	Date: <u>10/16/78</u>
LA/DR, B.Sandoval	<u><i>B Sandoval</i></u>	Date: <u>10/30/78</u>
ASIA/TR, J.Brady	<u><i>J Brady</i></u>	Date: <u>10/27/78</u>
DAA/DS/FN, T.Babb	<u><i>T Babb</i></u>	Date: _____

AGENCY FOR INTERNATIONAL DEVELOPMENT <b>PROJECT AUTHORIZATION AND REQUEST          FOR ALLOTMENT OF FUNDS PART I</b>		1. TRANSACTION CODE <input type="checkbox"/> A - ADD <input type="checkbox"/> C - CHANGE <input type="checkbox"/> D - DELETE	PAF
		2. DOCUMENT CODE 5	
3. COUNTRY/ENTITY <b>Nutritional Planning Systems          for International Agricultural Centers</b>		4. DOCUMENT REVISION NUMBER <input type="checkbox"/>	
5. PROJECT NUMBER (7 digits) <input type="checkbox"/> 931-1124.14	6. BUREAU/OFFICE A. SYMBOL DS/N B. CODE <input type="checkbox"/> 36	7. PROJECT TITLE (Maximum 40 characters) <input type="checkbox"/> Nutrition/Agricultural Production Research	
8. PROJECT APPROVAL DECISION <input type="checkbox"/> A - APPROVED <input type="checkbox"/> D - DISAPPROVED <input type="checkbox"/> DE - DEAUTHORIZED	ACTION TAKEN 10	9. EST. PERIOD OF IMPLEMENTATION YRS. <input type="checkbox"/> 0 <input type="checkbox"/> 3 QTRS. <input type="checkbox"/>	

10. APPROVED BUDGET AID APPROPRIATED FUNDS (\$000)									
A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE		E. 1ST FY <u>79</u>		H. 2ND FY <u>80</u>		K. 3RD FY <u>81</u>	
		C. GRANT	D. LOAN	F. GRANT	G. LOAN	I. GRANT	J. LOAN	L. GRANT	M. LOAN
(1) FN	331	311		859		-0-		941	
(2)									
(3)									
(4)									
TOTALS				859				941	

A. APPROPRIATION	N. 4TH FY		Q. 5TH FY		LIFE OF PROJECT		11. PROJECT FUNDING AUTHORIZED		A. GRANT	B. LOAN
	O. GRANT	P. LOAN	R. GRANT	S. LOAN	T. GRANT	U. LOAN	(ENTER APPROPRIATE CODE(S)) 1 = LIFE OF PROJECT 2 = INCREMENTAL LIFE OF PROJECT			
(1) FN					1800				2	
(2)										
(3)										
(4)										
TOTALS					1800		C. PROJECT FUNDING AUTHORIZED THRU		FY <input type="checkbox"/> 8 <input type="checkbox"/> 2	

12. INITIAL PROJECT FUNDING ALLOTMENT REQUESTED (\$000)				13. FUNDS RESERVED FOR ALLOTMENT	
A. APPROPRIATION	B. ALLOTMENT REQUEST NO. _____			TYPED NAME (Chief, SER/FM/FSD)  SIGNATURE  DATE	
	C. GRANT	D. LOAN			
(1)					
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TOTALS					

14. SOURCE/ORIGIN OF GOODS AND SERVICES

000   
  941   
  LOCAL   
  OTHER \_\_\_\_\_

15. FOR AMENDMENTS, NATURE OF CHANGE PROPOSED

FOR PPC/PIAS ONLY	16. AUTHORIZING OFFICE SYMBOL	17. ACTION DATE	18. ACTION REFERENCE (Optional)	ACTION REFERENCE DATE
		MM DD YY		MM DD YY

AGENCY FOR INTERNATIONAL DEVELOPMENT  <b>PROJECT PAPER FACESHEET</b>		1. TRANSACTION CODE <input type="checkbox"/> A = ADD <input type="checkbox"/> C = CHANGE <input type="checkbox"/> D = DELETE		PP  2. DOCUMENT CODE 3
3. COUNTRY/ENTITY <u>DS/N-RDA-8 Institutions working directly with LDCs</u>		4. DOCUMENT REVISION NUMBER <input type="checkbox"/>		
5. PROJECT NUMBER (7 digits) <u>931-1124.14</u>		6. BUREAU/OFFICE A. SYMBOL <u>DS/N</u> B. CODE <u>36</u>		7. PROJECT TITLE (Maximum 40 characters) <u>Research Nutrition/Agricultural Production</u>
8. ESTIMATED FY OF PROJECT COMPLETION FY <input type="text"/> <input type="text"/> <input type="text"/>		9. ESTIMATED DATE OF OBLIGATION A. INITIAL FY <input type="text"/> <input type="text"/> B. QUARTER <input type="checkbox"/> C. FINAL FY <input type="text"/> <input type="text"/> (Enter 1, 2, 3, or 4)		

10. ESTIMATED COSTS (\$000 OR EQUIVALENT \$1 - )						
A. FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	B. FX	C. L/C	D. TOTAL	E. FX	F. L/C	G. TOTAL
AID APPROPRIATED TOTAL	859		859	1800		1800
(GRANT) FN	( 859 )	(     )	( 859 )	( 1800 )	(     )	(     )
(LOAN)	(     )	(     )	(     )	(     )	(     )	(     )
OTHER U.S. 1.						
2.						
HOST COUNTRY						
OTHER DONOR(S)						
TOTALS	859		859	1800		1800

11. PROPOSED BUDGET APPROPRIATED FUNDS (\$000)									
A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE		E. 1ST FY <u>79</u>		H. 2ND FY <u>80</u>		K. 3RD FY <u>81</u>	
		C. GRANT	D. LOAN	F. GRANT	G. LOAN	I. GRANT	J. LOAN	L. GRANT	M. LOAN
(1) FN	331	311		859		-0-		941	
(2)									
(3)									
(4)									
TOTALS				859		-0-		941	

A. APPROPRIATION	N. 4TH FY <u>82</u>		O. 5TH FY <u>   </u>		LIFE OF PROJECT		12. IN-DEPTH EVALUATION SCHEDULED  MM   YY <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
	P. GRANT	R. LOAN	S. GRANT	T. LOAN	U. GRANT	V. LOAN	
(1) FN					1800		
(2)							
(3)							
(4)							
TOTALS					1800		

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 = NO  
 2 = YES

14. ORIGINATING OFFICE CLEARANCE	
SIGNATURE <u>Levin Hornstein (for MIF)</u>	DATE SIGNED MM   DD   YY <input type="text"/> <input type="text"/> <input type="text"/>
TITLE Director, Office of Nutrition	

15. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION
MM   DD   YY <input type="text"/> <input type="text"/> <input type="text"/>

October 26., 1978

ACTION MEMORANDUM FOR THE ASSISTANT ADMINISTRATOR FOR DEVELOPMENT  
SUPPORT BUREAU

THRU: DS/PO, Robert C. Simpson *Km for*

THRU: DAA/FN/DS, Tony Babb *B*

FROM: DS/N, Martin J. Forman *Martin Forman (A)*

Problem: In FY 1977 a PID in the amount of \$1.8 million was submitted for a project "Nutritional Planning Systems for International Agricultural Centers" and approved by AA/TA. A project paper was developed by DS/N which outlines the project and analyzes four proposed sub-projects for the incorporation of nutrition considerations into the crop research programs in the International Agricultural Centers. The Project Paper which includes the four sub-projects submitted by the Agricultural Centers was reviewed and endorsed by the Research and Development Committee at its August 17, 1978, meeting. To implement the four sub-projects analyzed in the Project Paper, as well as up to four additional ones, funding is requested in the amount of \$1.8 million over a period of three years.

Discussion: The International Agricultural Centers have as their prime consideration the development of higher yielding varieties. Increased production means more available food and more food, if it reaches those in need and is acceptable, should mean better nutrition.

However, increased yield cannot be the sole determinant of success. For example, the International Rice Research Institute may develop a new higher yielding rice variety with a 10% (rather than 7%) protein content, an obviously exciting plus. But, if the color, taste, texture, or even grain shape isn't acceptable to rice eaters, the efforts expended in introducing this variety will probably be wasted. Furthermore, it may be that the digestability of the new variety may be poor or the amino acid composition of the new variety may be such that the protein availability in the high protein rice is lower than in an ostensibly lower protein containing variety. Thus, when new varieties of improved yield are being considered for further exploration, some knowledge concerning these characteristics (nutritional quality and acceptability) can well be used to select those varieties that should receive intensive study.

Another example - The International Center for Tropical Agriculture (CIAT) has been concerned with phaseolus vulgaris - again, the major concern here is yield. Legumes, in particular, can be troublesome from a nutritional and acceptability viewpoint. Toxic substances may be present; sulfur containing amino acids may be low; cooking time can vary enormously; storage quality can be poor; flatulence may be a problem, etc. These factors aren't at all evident when yield alone is considered.

Yield should be a primary concern. However, if a number of high yielding varieties are to be studied in any depth screening methods must be developed for these other qualities which, if not considered, may lead to nutritionally inferior varieties being introduced or new varieties being rejected.

The purpose of this project is to provide "seed" money over a two - three year period to permit the Centers to evaluate the benefits to be derived from introducing a stronger nutrition component into their breeding programs. At the end of this period, the Center must decide whether to continue this activity as part of its own core program.

DS/N has linked its program priorities with the proposed Center's projects so that useful information is gained regardless of any subsequent go or no go decision by the Center.

To date, we have worked with five institutions. Four proposals have been received and these are the projects that have received R&DC approval. A fifth proposal is being developed by the Potato Center in Lima, Peru.

1. International Rice Research Institute (IRRI) - Grant in the Amount of \$327,000

The project proposes to establish a collaborative program between IRRI and The Food and Nutrition Research Institute (FNRI) in Manila. The purpose would be to study nutritional and acceptability problems related to rice-based diets in pre-school children in S.E. Asia.

In these collaborative studies, IRRI will be responsible for the agricultural and chemical inputs and FNRI will conduct the clinical assays and address other nutritional and acceptability concerns such as bulk, effect of degree of milling, digestibility, and texture. IRRI and FNRI have stated that they will be able to take over the maintenance of the clinical assay laboratory at the end of the three year "seed" period. This project is directly related to DS/N program priorities. DS/N has

proposed that two new clinical assay laboratories be set up -- one in Asia and one in Africa. The Asia laboratory would be concerned primarily with rice based products. By bringing FNRI and IRRI together, DS/N will not only have the type of Center we wanted in Asia but have its expertise linked together with a key user of its output.

2. Asian Vegetable Research and Development Center (AVRDC) - Grant in the Amount of \$140,000

Most of the Centers are concerned with food staples whose major nutritional impact is on calories and proteins. AVRDC provides a window for looking at micro nutrients; the minerals and vitamins that are also essential to nutritional well being. It is known that Vitamin A and iron deficiency exist in the Philippines, Indonesia, Thailand and other countries within the outreach of AVRDC. Other micronutrient deficiencies probably exist.

To ascertain the nature of an appropriate nutrition component for the AVRDC program, nutritionists from Indonesia, Philippines, Taiwan, Thailand, and the United States met to examine the AVRDC program and to look at the nutrition needs in the region. The participants, including AVRDC staff, unanimously concluded that a nutritionist would be an indispensable addition to the staff and recommended that A.I.D. support the addition of a nutritionist to the AVRDC staff for a two year trial period.

A work scope for the nutritionist was developed. During the first year, the "nutritionist" would determine in each of the regions of interest to AVRDC: (a) existing nutrients deficiencies and their causes; (b) the consumption patterns in the different regions and information regarding food habits, taboos, acceptability, etc.; (c) based on these data, the nutritionist and AVRDC members experienced in introducing new crop varieties will seek to determine the appropriate crops that could meet the nutrient needs identified.

The second phase of the project will be to analyze the collected data for implications for action in the AVRDC outreach areas.

In addition, one country or region will be studied intensively in close collaboration with the host country. The output of this effort will be a determination of the nutrient deficiencies, the nature of an agriculture intervention to alleviate these deficiencies, and the initiation of a program to alleviate these deficiencies.

One major issue dominates the AVRDC scene - that is, the uncertainty concerning its future. We believe that despite uncertainties implementation is appropriate. Basically, information gained as a result of this venture would be immensely useful to any new center addressing the same problems

in the same region.

3. International Center for Tropical Agriculture (CIAT) - Grant in the Amount of \$247,000

The third sub-project is concerned with factors affecting acceptability and nutritive value of food legumes. Three key Latin American institutions are linked together: CIAT, which is the leading Agriculture Center for phaseolus vulgaris; INCAP, a leading nutrition institute in Central America with a wealth of experience in legume processing and nutritional studies; and the National Institute of Nutrition in Venezuela, with a particular expertise in determining the types of protein present in beans.

(1) Objective

The major objective of the project is to develop a legume screening program which could be used by CIAT to incorporate "nutrition" considerations into its legume program.

(2) Description

Stage I (Year One) - CIAT will supply varieties for the study. INCAP will analyze these samples for: (a) protein quantity and quality; (b) tannin content; (c) water absorption; (d) cooking time; and (e) protein availability.

These factors will be related to consumer preferences obtained through appropriate regionally specific field studies.

INN will analyze for variations in protein type.

CIAT will correlate and analyze the data, develop a plan for improving the varieties, and arrange for the production of most promising varieties.

Stage II (Years 1 and 2) - CIAT will supply improved varieties to INCAP and INN for testing to confirm breeding predictions. INCAP, in cooperation with CIAT, will determine the analytical and acceptability tests most useful for incorporation into CIAT's screening program.

Stage III (Years 2 and 3) - CIAT and INCAP will collaborate in establishing a demonstration test of an improved variety in one location where previous surveys have provided information on consumer preferences.

The introduction of the variety will be followed to determine whether the farmers grow the variety, the yield is as predicted, acceptability is

improved, and consumption increased.

The accomplishments of the project by the end of the third year are expected to include:

- (a) The initiation of a screening procedure at CIAT (funded by CIAT) that will be useful in selecting new varieties not only on the basis of yield but also on the basis of predicted acceptability and nutritional quality.
- (b) A CIAT decision on nutrition considerations to incorporate into their program.
- (c) An estimate of the cost of introducing the proposed screening program into the core CIAT program.

This project replaces a project that DS/N proposed to carry out aimed at identifying the obstacles that limit legume utilization.

#### 4. International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) - Grant in the Amount of \$144,000

There is interest at ICRISAT in better understanding the relationship between consumer acceptability and the market price of commodities (sorghum, millet, pigeon peas and chick peas). The market price reflects a number of obvious qualities -- color, size, etc. There are also non-evident (cryptic) properties such as protein content, swelling capacity and dry volume that are also reflected in the price. These cryptic qualities are not recognized by the consumer or the experienced trader. Value is attached on the evident qualities but they reflect more basic properties.

Thus, the obvious characteristics function as indicators of other qualities related to digestibility, cooking quality, nutrient composition, etc. The proposed study would look at these relationships and with the help of consumer acceptance studies try to relate market price, consumer preference and these "cryptic" qualities.

Such research is important in that it can lead to the development of relatively simple methods for screening breeding material for consumer acceptance and nutritional quality.

The objectives of the study, therefore, are:

- (1) To identify relevant characteristics which determine consumer preference as reflected in the market price of ICRISAT crops.

(2) To determine the reason why these relevant qualities influence consumer preference, i.e., to relate functional properties useful in food preparation and nutrient qualities to these preferences.

(3) To develop efficient screening methods to insure good consumer acceptance and nutrient quality of new varieties based on simple chemical and physical tests that reflect desired nutritional and functional qualities.

(4) To assess potential consumer preference of new seeds by weighting the relevant quality according to regional consumer preferences.

ICRISAT key personnel were in unanimous agreement that a food/technologist/nutritionist working at ICRISAT in cooperation with their economic and biochemistry staff could provide answers unobtainable with present expertise.

During the two year "seed" period, the scientist on board would help:

--Develop and carry out the required tests and analysis of market samples and consumer panel surveys.

--Study the relationships between nutritional qualities, functional qualities and consumer preferences.

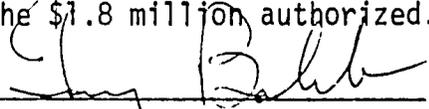
(1) While the nutritionist would be involved in the collection of market samples, the task would primarily be the responsibility of the Economic Staff.

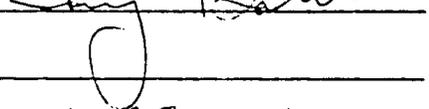
(2) The quality analyses to identify "indicator" qualities would be undertaken with support of the biochemistry laboratory.

It will require in this instance a food technologist/nutritionist with a background in economics and statistics to carry out this project.

ICRISAT has suggested that the assignment begin in early 1979 when new laboratory facilities will be available. The expectation is that the assignment will develop into a long-term activity of ICRISAT.

Recommendation: That you approve the attached Project Paper, which describes the first four, of no more than eight sub-projects, to be undertaken under this project. Funding of the first four projects will require \$859,000, from FY 1979 funds, of the \$1.8 million authorized,

APPROVED: 

DISAPPROVED: 

DATE: 11.28.78

Attachment

Project Paper "Nutritional Planning Systems for International Agricultural Centers"

7  
11-4  
March 3, 1978

MEMORANDUM TO : DS/N, Mr. Irwin Hornstein  
FROM : DS/PO, John Gunning  
SUBJECT : DS/PO Review of Project Papers on AVRDC and IRRI as  
subprojects of the Nutrition Ag Centers Project

Subject project papers were reviewed last Friday in a DS/PO internal review. Both papers were considered unacceptable in their present form. One general comment was that it might be easier to submit one general project statement to the files rather than repeating it in the first 3 or 4 pages of each subproject.

Comments on AVRDC Paper

1. There is no real project description. What will AVRDC do with this money, what will be the outcomes of the project? (Outputs listed in paper are not really outputs.) The purpose of the project needs to be more specific. Putting in a scope of work would be very helpful toward solving these problems.
2. The proposal from AVRDC should have been attached so that their rationale for this activity could be examined. And what is AVRDC's contribution to this project? For instance, are they supplying housing since that isn't mentioned?
3. Has TAC been consulted regarding this particular activity?
4. Who is going to contract with the nutritionist proposed? AID or AVRDC?
5. One of the conditions of approval of the PID was that a technical committee be set up to work on project development. Was this done? Their clearance should show on a PP facesheet.

During review of the PID, ASIA/TR specifically asked to be involved in project development of any activities being proposed in their region. Both DS/AGR and the Asia Bureau should be involved in a rewrite of this project paper.

Comments on IRRI Paper

1. This document is not at all clear; it doesn't seem to describe a project at all but merely comments on IRRI proposal (which should have been attached). Is the purpose to establish a lab or do some applied research (on what to what end) or what?
2. Whatever the main purpose of the project, the research element noted in the paper requires the review of the research staff. They should show as clearing on the PP facesheet.

3. Again, as mentioned above, there should be input from ASIA/TR, and AGR.
4. What will IRRI-~~ENRI~~ contribute to this effort?

PROJECT PAPER: NUTRITION IN AGRICULTURAL CENTERS  
International Rice Research Institute (IRRI)

PART I: PROJECT SUMMARY AND RECOMMENDATIONS

B. Recommendations

GRANT TO IRRI \$327,000

C. Description of Overall Project

Summary of Problem

This activity supports the Agency effort in providing low cost nutritious foods in the LDC's (RDA-8)

The crop research programs of the International Agricultural Research Centers, as well as those of the LDC's to which they relate, concentrate their efforts on producing new crop varieties (cereals, legumes, roots and tubers,) that will provide higher yields. In the drive for increased production, other important factors grouped under "nutritional considerations" and including nutritional quality, processing characteristics, storage quality and consumer acceptability are often overlooked by the breeder. The utility of new crop varieties in combatting malnutrition could be increased and their introduction on a large scale expedited if these considerations could be incorporated into the screening procedures by plant breeders for selecting varieties for continued study. This project will explore, in collaboration with the International Agricultural Research Centers, various ways of providing the plant breeder with appropriate guidelines for screening food crop varieties for these factors.

Inputs to the International Agricultural Research Centers will assume a variety of forms, based on the nature of the Center's overall program, the particular food commodities being considered, the nutrition problem of the region being served by the Center and the stage of research in a particular field. For example, in one Center it may be appropriate to add personnel trained in nutrition, food science, food economics and technology. In another it may be sufficient to establish cooperative arrangements with universities or other country institutions having nutritional expertise. In another Center the decision may be to incorporate analytical methods consumer oriented research and broader based variety screening procedure to their ongoing breeding effort. Still other variations will undoubtedly develop as experience is gained.

The overall purpose of the project is to institutionalize the incorporation of nutrition considerations into the International Agricultural Research Center's core programs, now primarily production oriented. The principal rationale for this is that consumption patterns may not parallel production potential and that malnutrition may not be alleviated without other measures favorable to nutrition acceptability and potential nutritional impact.

Written proposals have been received from the Center for International Tropical Agriculture, (C.I.A.T.), Asian Vegetable Research Development Center, (A.V.R.D.C.), International Rice Research Institute, (I.R.R.I.), and International Potato Institute, (C.I.P.) and additional requests are expected from several other International Centers. A total funding level of \$1.8MM and up to nine Centers will be involved. In each proposal received to date the investigators want to explore how to incorporate nutritional concerns into their research program.

In addition to the evaluation planned for each sub-project, there will be an evaluation of the overall project by selected Center's staff, TA/N, TA/AGR, PPU, at about the 18th month to assess the effectiveness and efficiency of the approaches being used to achieve the objective.

At the conclusion of the project the Centers should be able to:

1. Identify the specific portions of their programs where incorporation of nutritional considerations would be cost/effective.
2. Decide what nutrition considerations are appropriate for core funding.

The procurement of the Center's projects will be by grant, the mechanism selected as most suitable for institutional development, which is the basic purpose of the project. Since all projects will be with one of the International Research Centers comprising the unique world wide network, competitive procurement is considered not necessary.

The following describes what will be done at one Center (IRRI jointly with the Food and Nutrition Research Institute of the Philippines.

#### Objectives

A Nutrition Evaluation Laboratory (NEL) will be set up jointly by the International Rice Research Institute (IRRI) and the Food and Nutrition (FNRI), National Science Development Board of the Philippines. The primary purpose will be to gather data from metabolic studies with children that will serve to guide plant genetics research and food technology toward better rice based foods and diets for the vulnerable age groups of South East Asia. IRRI programs in plant genetics now cover food crop varieties used through out the region that, through building collaboration with FNRI, should extend the outreach of this new testing center to the entire region.

The primary problems of rice diets to receive attention are protein and calorie content (high bulk), digestibility, nutrient availability; and acceptability. Information on rice already in hand from animal studies at IRRI shows wide genetically controllable variability in many of these factors arguing well for the development of improved varieties.

### Summary Findings

The proposal from IRRI shows an advanced state of understanding about what nutrition problems occur in rice-eating cultures and how these may be alleviated through rice breeding research linked to nutritional and acceptability testing. The proposal also contains sufficient detail on the technical, manpower, and financial requirements for collaborative research between IRRI and INRI to give us the confidence that the project purpose can be achieved within the time available. This advanced state of project development has been achieved because of the staff competence of the two institutions and the technical assistance provided by consultants experienced in the evaluation of cereal foods in young children, joined in another AID project in Lima, Peru, (Drs. Graham and MacLean of Johns Hopkins.) The testing of rice varieties for improved nutritional value are well underway at IRRI in rat studies as reported in their 1977 annual report and it is timely now to begin the metabolic studies in humans.

It is worth noting, that IRRI and INRI have already stated their commitment to continue the metabolic testing after the AID project terminates in three years.

### Project Issues

- A. How will the metabolic center serve the Region?
- B. Is sufficient acceptability testing planned over and beyond the acceptability to the young child.

### Comments

A. A metabolic test of varieties of rice and other commodities of importance to be carried out in children of Philippine origin is expected to be representative of orientals in South East Asia. If the Center were to serve India and other

non-oriental Asians, then it is probable that a different that a different test population could be needed. Since India and Bangladesh already have well developed metabolic facilities, the Philippines Center would emphasize only orientals and exchange varieties and information with the other Asian researchers in order to cover the racial differences if any.

B. In the proposal the investigators mention that prior to clinical testing some acceptability tests will be carried out; By way of clarification we have obtained additional information attached that shows that acceptability to significant population groups, i.e. those making the purchases, will be <sup>obtained</sup> obtained as well as testing the children.

### Background

Milled rice is the staple food and the major source of protein in the diets of tropical Asia. In this region weaning foods are also rice-based. Weaned children in tropical Asia suffer from energy-protein malnutrition due to low intakes of food. Weaning foods definitely are not providing adequate calories and protein and the following factors contribute to the difficulties of feeding a small and frequently ill child: (a) inadequate food supply (poverty). (b) bulk and viscosity of rice gruel, (c) lack of appetite, palatability, or taste appeal or ability to sustain sensation of satiety; and/or (d) ignorance and food habits -- three meals instead of 3-4 hour feeding intervals in view of competing demands on mothers work time.

Rice has good quality protein among cereals with an amino acid/lysine score of over 60%. Its main nutritional limitation is its low protein level in the grain. Since rice is limiting in lysine but rich in cystine<sup>2</sup> and methionine,

its protein complements lacks proteins which are deficient in sulfur acid but rich in lysine. Weaning foods in the Philippines are either rice-mung bean or rice-fish. Easet Infant Food in Bangkok is rice-soybean mixture.

The energy density of rice gruel sufficiently fluid to be fed a child under 1 year of age, cannot contain more than 20-30 kcal/100 g. By contrast, 100g of liquid milk contain 70 kcal. The low energy density of cereal gruel could be increased by up to 30% by adding sugar or oil without reducing its protein: energy ratio below 5%, and without an increase in viscosity (P.R. Payne, 1976.) An alternative method is to study the effect of existing variation in starch properties (amylose content, gel consistency and gelatinization temperature) among rice varieties on water-absorbing and gel-forming properties of the rice gruel. All these properties show extreme variability in milled rice than in other cereals for food use. Thailand is unique in having glutinous or waxy rice as staple in North and Northeast and nonglutinous or waxy rice in the rest of the country. Discussions with Thai nutritionists, however, support the observation that man tends to measure his rice consumption by weight rather than by volume, as he adjusts his intake accordingly.

Rice diets have adequate content of iron and other minerals, but they have poor availability due to phytate content of rice. Phytate contents remains high since milled rice is consumed as boiled rice without any fermentation in contrast to bread wheat. Rice diets are also extremely poor in Vitamin A.

Since the discovery of the opaque-2 gene in corn, considerable breeding effort has gone to develop new varieties of cereals, legumes and other plants with higher level of utilizable protein. Higher protein cereals, legumes and new weaning foods, however, must be assessed for nutritional value and acceptability using Protein-Calorie Advisory Group Guideline 6 (Preclinical Testing) and 7 (Human Testing Procedures).

Methods. FNRI. The male toddlers will be recruited mostly from orphanages and will have to pass clinical examination (including biochemical and fecal examination) as being apparently health, undergo medical and nutritional treatment and be trained for fecal and urine collection.

Nitrogen balance studies in toddlers 15 to 24 months old will be undertaken to determine the apparent digestibility and apparent biological value and apparent retention of protein in high protein cereals and legumes and rice-based weaning foods. The protocol will be based on the current 1977-1978 studies supported by US AID to determine the protein quality of low protein (IR32) and high protein (IR480-5-9) milled rices relative to casein (Casec, Mead Johnson), used on convalescent Peruvian preschool children at the Instituto Investigaciones Nutricional, Lima, Peru by the group of Dr. G.G. Graham, Johns Hopkins University, Baltimore, Maryland. The subjects will be given 3 days to adapt to the test diet before conducting the 6-day balance period. Test diets will be isonitrogenous with the case in control and nitrogen level of the diets will be at least 6.2% of calorie intake. Low fruits and vegetables will be added to the diets for variety. Vitamins and minerals will be given daily and water intake of each child will be controlled.

The protocol will have the approval and clearance of the Philippine Committee of Human Rights and Clinical Investigations and the consent of parents or guardians. All foods for study must have been assayed for bacteriological safety, toxicity and subjected to rat assay for protein quality as well as acceptability tests before it can be considered for evaluation.

Total nitrogen of diets, fecal and urine samples will be determined by macro-Kjeldahl method. Fecal samples will be analyzed for moisture and fat. Blood serum samples will be analyzed for total protein and albumin. Creatinine will be determined on daily urine excretion. A portion of the blood serum will be sent to IPRI for Na/K assay and for analysis of free amino acid composition.

IPRI. High protein rices and other high protein cereals and legumes will be analyzed for protein content (and, if needed, other protein properties) and amino acid composition by the IRR Chemistry department. Problems related to texture bulk, and other physical properties of these foods and weaning food formulations, including degree of cooking and in vitro digestibility will be investigated. In addition, IRR will also analyze blood serum samples for Na/K content by atomic absorption spectrophotometry ( and for free amino acid composition by ion-exchange chromatography as needed).

IRR now has two Beckman Spinco Amino Acid Analyzers Model 1200 or equivalent. One of the units can be devoted wholly for physiological fluid analysis using microcolumns and the second unit can be used for the usual 2-hr hydrolyzate run. With the addition of automatic regeneration and equilibration, second buffer changer and integrations, the output of the units can be more than doubled.

Detailed Description

Sector Goal: To improve the nutritional status of the poor and vulnerable groups.

Sub-Sector Goal: To introduce nutritional considerations into Agricultural research planning and programming.

Goal Achievement will be measured by the extent of adoption by the Center of the findings of the metabolic analyses as guides to the IRRI and other regional research efforts.

Outputs

1. A jointly sponsored and stably funded regional Metabolic Center for southeast Asia engaged in the human evaluation of important caloric and protein foods of the region.
2. Core funded nutritional inputs to the Metabolic Center at IRRI.
3. Varieties of higher nutritional content and of high acceptability.
4. Field demonstration of an improved variety in the Philippines.

The basic assumptions are:

- A. The southeast Asia region will look to the Center in the Philippines for leadership in the metabolic testing of locally preferred rice varieties.
- B. That the nutritional achievements will be sufficient to justify IRRI and FNRI core funding.

Output Indicators

1. Profiles of acceptable rice variety by region.
2. Genetic variability of nutrients in major rice varieties and potential for improvement.
3. Procedures for incorporating metabolic screening into crop genetics programs.
4. <sup>2 copies of</sup> A demonstration of the introduction of an improved variety in the Philippines.

Inputs.

1. The major input is the coordinated biochemical, nutritional and human metabolic tests.
2. FNRI will renovate the laboratory in early 1979 to accommodate ten children. Consulting assistance of Dr. MacLean to NEL.
3. Funding to support the joint effort between IRRI and FNRI.
4. IRRI will handle agricultural biochemical and food technology inputs as well as financial control, foreign purchasing and responsibility for reports.
5. TA/II will be responsible for evaluation and for dissemination of results to other regions, in close communication with DS/Agr.

The FNRI Metabolic Studies Section will renovate and manage the Laboratory, supervise its staff, recruit subjects, provide medical and pediatric care, calculate and prepare diets, collect and analyze pediatric samples, perform routine blood analysis and proximate analysis of samples and maintain the laboratory facilities.

Principal Investigators

IRRI Administration: Dr. H. C. Prady, Director General

Financial : Mr. Faustino M. Salacup, Controller

Research : Dr. E. O. Juliano, Chemist (Biodata attached)

FNRI Administration: Dr. C. L. Intengan, Director

Financial  
& Research : Miss P. V. Roxas, Science Res. Assoc. IV (Biodata attached)

Responsibility for the termination of any study will be that of the staff of the Laboratory, such as in cases where the child gets sick or does not show growth on the diet. A pediatrician will be employed to look over the health of the children on a retainer basis.

## PART III: PROJECT ANALYSIS

### A. Technical Analysis

The U.S. and other donors are making increased investments in international agricultural research in agricultural planning and programming and in nutrition programming. Since the ultimate goal of these investments is to provide information and resources to assist LDC populations to reach a higher quality of life, the role of nutrition in these investments becomes critical.

Methodologies to be used are well established, reliable, and straight forward. What remains to be done is to apply the methods and generate the data base to support the integration of nutritional considerations in the food systems of the regional research and development program.

### Technology and Employment Effects

No additional technology and employment effects are expected in this project beyond those already included in IRRI's goal of increased crop production.

### B. Financial Analysis and Plan

#### 1. Financial Rate of Return/Viability

A financial rate of return is not expected from this project. This is a non-revenue generating project that should over the long range improve the nutrition status of the general population; this itself may have production implications in the long range.

#### 2. Recurrent Budget Analysis of Implementing Agencies

It is not expected that recurring U.S. expenditures will be required beyond the life of the project.

#### 3. Financial Plan/Budget Tables

This project is to be carried out under a grant to IRRI. The budget outlines expected costs by year and does not anticipate funding from other sources

except for usual staff support and institutional overhead costs attributable to the staff activities. (The budget is shown in Table 1).

#### Summary

IRRI and FNRI already have experience in costing the type of work being proposed and these will be negotiated to be consistent with local practices.

#### Social Analysis

All activities under this project are tailored to the conditions of social milieu of the LDC's. All social-economic surveys are constructed to be compatible with the local environment. All demonstration projects will intervene with an improvement and any improvement introduced will not summarily be withdrawn. All activities carried out in the culture will be discussed and cleared with local officials prior to their initiation.

#### Economic Analysis

No direct economic impact is expected to occur as a result of this short-lived project. A purpose of the IRRI overall program is to have an effect on the economic welfare of the small producers of the region but this is a long range program to which this project is unlikely to have an influence except that with less malnutrition in the environment better worker productivity could eventually occur.

### PART IV: ANALYSIS OF RECIPIENT AND AID/ADMINISTRATIVE ARRANGEMENTS

#### 1. Recipients

The IRRI core budget is approved by CGIAR of which AID is a member. IRRI is one of the best developed of the centers networks institution and has a clear picture than most of ~~its role~~ and of the role of nutrition in its program.

#### 2. AID

The project is expected to require:

10 days of DSB/IRI staff time in: FY 78

10 days in FY 78 and 79.

The major DSB staff involvement will be to coordinate IRRI activities with Asia Bureau and Mission personnel and programs, arrange for and participate in reviews and evaluations and to disseminate findings.

3. Constraints

IRRI may need assistance to regionalize the Evaluation Laboratory. *This is not budgeted but could be made possible if Mission supported.*

4. Reports

Reports on rice varieties will be prepared as progress reports. These will be compiled as an annual report each year for AID. Annual reviews of the project will be conducted by AID staff and consultants.

Utilization

Utilization is expected to occur as variety reports and seed is distributed.

Evaluation Plan

By the middle of the second year of the project DS/N and DS/AGR will carry out an evaluation of IRRI and FNRI progress. The first level to be examined will be the utility of the Nutrition Evaluation Program. The second level is to examine the cultivars <sup>rsy</sup> being recommended to country program introductions for improved nutritional and food use characteristics. The next level is to ascertain the effect that the project has had on local programs. Finally a review will be carried out on what effect the nutrition presence may have had on the nutrition research programs at other South East Asian locations.

The purpose of each level of evaluation will be to ascertain the efficiency, effectiveness and significance of the project activities in contributing to the project purpose. The evaluation will specifically list the tasks that the NEL on a continuing basis, the costs of doing this, and the extent of improvement in crop characteristics that it is reasonable to expect. Finally an estimate will

made of the attitude of the Center's administration toward the inclusion of nutritional concerns into the overall programs and in what way this might be improved.

Implementation Plan

Outline - January - June 1978

1. Project Paper Approved.
2. Grant with IRPI.
3. Plan for Nutrition Evaluation Laboratory

June - December 1978

4. Begin and complete refurbishing NLL.
5. Plan for improved variety production.

December 78 - June 79

6. Carry out acceptability studies -- new varieties.
7. Begin existing variety metabolic tests.
8. Begin new variety testing.

June - December 1979

9. Continue new variety testing.
10. Select and plan demonstration test in Philippines.

January - December 1980

11. Carry out demonstration test and evaluate.

3. Waivers

None required.

Financial Requirements

A. First Year

FNRI

Salaries

1. Research Associate IV (20% of time)

\$ 520.00

2 Research Associate I (30% of time)	600.00	
2 Chemists (100% of time)	4,000.00	
1 Dietician (100% of time)	2,000.00	
1 Typist (100% of time)	1,200.00	
6 Attendants (100% of time, 40 hr week)	2,800.00	
3 Aides (kitchen attendant, laundry aide and laboratory aide) (100% of time)	3,300.00	
1 Pediatrician (retainer's fee)	1,500.00	
1 Finance Officer (20% of time)	300.00	
1 Statistician (10% of time)	200.00	
		\$22,420.00
15% overhead of basic salaries		\$ 3,363.00
<u>Technical advisory services</u> (1-2 months/year; Dr. W. G. MacLean of Johns Hopkins University is preferred) -- to be furnished by US AID.		
		\$22,020.00.

Equipment

(one each Bausch and Lomb spectrophotometer, colorimeter, electro-phoresis apparatus, freeze drying set-up (5-liter), freezer (14-cubic feet), exhaust blower and exhaust assembly, laboratory sink with base cabinet, top-loading balance, weight balance, and oven plus accessories; two filing cabinets and three 1.5 h.p. air conditioners)

Supplies

Supplies and materials - laboratory chemicals, supplies and glassware, food, medicines, vitamins and minerals, linen, toys, reference books and publications, Sundry- incentives to institutions/guardians, electricity, water, maintenance and communication, and local travel. \$21,000.00

Visits by FNKI staff member to Instituto Investigaciones Nutricional (Lima, Peru), Johns Hopkins University (Dr. G. G. Graham and Dr. W. G. MacLean), UC Berkeley (Dr. D. Calloway) and participation in International Nutrition Congress, Rio de Janeiro, Brazil

	\$ 4,500.00
Subtotal	\$73,303.00

IRRI

Salaries

1 Chemist (5% of time)	\$2,400.00	
1 Assistant Chemist (35% of time)	\$3,000.00	
1 Laboratory Assistant (100% of time)	\$2,400.00	
1 Laboratory Assistant (50% of time)	\$1,200.00	\$9,000.00
15% overhead of basic salaries		\$1,350.00
Supplies, including local travel, communication, publication costs		\$20,000.00

Equipment

Accessories to two Beckman Spinco Amino Acid analyzers to allow physiological fluid runs and semi automatic operation (one computing integrator, one additional analyzer module, two pressure regulation assembly for ninhydrin reservoir, set of physiological fluid columns, resins, cuvettes and accessories, two automatic regeneration and equilibration kits and three manual sample injectors with adjustable column fittings)

	\$20,700.00
Subtotal --	\$59,050.00
Overall for 1st year --	\$132,353.00

B. Second year estimate	\$90,000.00
C. Third year estimate	<u>\$105,000.00</u>
	\$327,353.00

Duration and effectivity July 1978 for three years after which IRRI and FHRI will be able to take over the maintenance of the laboratory.

PPV Charline — Revised Budget 12/29  
PD-AAH-708

PROJECT PAPER: NUTRITION IN AGRICULTURAL CENTERS - ASIAN VEGETABLE RESEARCH AND DEVELOPMENT CENTER

PART I: PROJECT SUMMARY AND RECOMMENDATIONS

B. Recommendations

Grant to AVRDC \$164,000

C. Description of Overall Project

Summary of Problem

This activity supports the Agency effort in providing low cost nutritious foods in the LDC's (RDA-8).

The crop research programs of the International Agricultural Research Centers, as well as those of the LDC's to which they relate, concentrate their efforts on producing new crop varieties (cereals, legumes, roots and tubers,) that will provide higher yields. In the drive for increased production, other important factors grouped under "nutritional considerations" and including nutritional quality, processing characteristics, storage quality and consumer acceptability are often overlooked by the breeder. The utility of new crop varieties in combatting malnutrition could be increased and their introduction on a large scale expedited if these considerations could be incorporated into the screening procedures by plant breeders for selecting varieties for continued study. This project will explore, in collaboration with the International Agricultural Research Centers, various ways of providing the plant breeder with appropriate guidelines for screening food crop varieties for these factors.

Inputs to the International Agricultural Research Centers will assume a variety of forms, based on the nature of the Center's overall program, the particular food commodities being considered, the nutrition problem of the region being served by the Center and the stage of research in a particular field. For example, in one Center it may be appropriate to add personnel trained in nutrition, food science, food economics and technology. In another it may be sufficient to establish cooperative arrangements with universities or other country institutions having nutritional expertise. In another Center the decision may be to incorporate analytical methods consumer oriented research and broader based variety screening procedure to their ongoing breeding effort. Still other variations will undoubtedly develop as experience is gained.

The overall purpose of the project is to institutionalize the incorporation of nutrition considerations into the International Agricultural Research Center's core programs, now primarily production oriented. The principal rationale for this is that consumption patterns may not parallel production potential and that malnutrition may not be alleviated without other measures favorable to nutrition acceptability and potential nutritional impact.

Written proposals have been received from the Center for International Tropical Agriculture, (C.I.A.T.), Asian Vegetable Research Development Center, (A.V.R.D.C.), International Rice Research Institute, (I.R.R.I.), and International Potato Institute, (C.I.P.) and additional requests are expected from several other International Centers. A total funding level of \$1.8MM and up to nine Centers will be involved. In each proposal received to date the investigators want to explore how to incorporate nutritional concerns into their research program.

In addition to the evaluation planned for each sub-project, there will be an evaluation of the overall project by selected Center's staff, TA/N, TA/AGR, PPU, at about the 18th month to assess the effectiveness and efficiency of the approaches being used to achieve the objective.

At the conclusion of the project the Centers should be able to:

1. Identify the specific portions of their programs where ,  
incorporation of nutritional considerations would be  
cost/effective.
2. Decide what nutrition considerations are appropriate for core  
funding.

The procurement of the Center's projects will be by grant, the mechanism selected as most suitable for institutional development, which is the basic purpose of the project. Since all projects will be with one of the International Agricultural Research Centers comprising the unique world wide network, competitive procurement is considered not necessary.

The following describes what will be done at one Center (A.V.R.D.C.), the second sub-project.

#### PROJECT DESCRIPTION

A.V.R.D.C. has proposed to learn how to incorporate nutritional considerations into their programs by adding a nutritionally trained and experience staff member, first temporarily and then, if mutual benefits can be found, permanently. AID funds have been requested for the two-year trial period to support this staff member. The program activities undertaken by the staff will be supported by A.V.R.D.C. from other funds.

The nutritionist will join the Nutrition/Environment/Management Program; (NEM) a multidisciplinary group of five that evaluate new breeding lines of vegetable crops for nutrient content, income generating capacity, and cultural acceptability. In the past the nutritional concerns have been limited to food analyses carried out by others. With the addition of the new staff member they plan to take a broad approach encompassing analyses of varietal differences in nutrient content, and environmental effects, as well as to determine nutrient needs of the poor of the region.

Since the vegetable crops of AVRDC program now include tomato, chinese cabbage, sweet potato, white potato, mung and soy beans, the N.E.M. group will need to make a strong case for additional ones and strike a balance between income generation and nutrient production in their program design. Furthermore the region has diverse climates cultures and geography, resulting in specific local differences, therefore one of the first tasks of N.E.M. will be to draw up status reports from existing data for major country/crop combinations that fall within the crop mix of AVRDC and then relate these characteristics to nutritional status of the people. From the data NEM will select the crop mixes and varieties most likely to be adopted by the farmer and that should improve the nutrient intake of consumers. Some varieties may be ready now, others may require breeding prior to demonstration tests.

The N.E.M. group considers the behavior of the entire food chain when planning for and advising cropping change because reasons for loss or failure of new introductions may occur most anywhere from marketing and food preparation to grower. With such a broad view N.E.M. should offer technical challenges that will prove attractive to a food scientist/nutritionist. Likewise a nutritionist on such a team should be able to contribute significantly to better varietal selection. During the two year project we expect AVRDC to be able to decide if a nutritionist on the permanent staff is desirable and, if so, to have core funding in place and staff recruited by the third year.

SUMMARY FINDINGS

AVRDC held a workshop in June of 1976 in which their total program was reviewed with representatives from Taiwan, The Philippines, Indonesia, New Guinea and the U.S. In conjunction with the review AID provided two consultants to go over their ideas about adding nutritional considerations to their program. The consultants have reported that the nutrition position visualized by AVRDC investigators and the administration appears to be challenging and that the working environments should provide research opportunity for a nutritionist oriented toward food analysis, food technology, field studies, nutrition surveys, and socio-economic studies. In fact the demands on the nutritionist may be so extensive that no one person could fulfill all of them. We have taken this into account in our discussion with staff members, suggesting that AVRDC should develop close relationships with local Taiwan Institutions having nutritionists of various orientations (medical, food science, dietetics, anthropology), even calling in consultants for highly specialized inputs from time to time. The findings indicate that AVRDC is ready to implement the project immediately and that an acceptable staff member both to AID and to AVRDC has been located, ~~Dr. R. Engel of V.P.I. Dr. Engel is planning to retire in August but welcomed the opportunity to tackle this challenging assignment. As you know Dr. Engel through V.P.I. has been under contract to USAID Philippines for many years.~~

C. Project Issues

- A. The possibility that AVRDC may need to move to another country to attract International Funding.
- B. Shortness of time to institutionalize nutrition in any Institution.
- C. How cost/effective is this approach toward achieving the project purpose?

Comments

- A. It is recognized that AVRDC may need to change its base of operation if the base of support is to become truly international and a full member of the Centers network. Keeping this in mind, a two year assignment of staff has been selected assuming that AVRDC would not move its headquarters much sooner.
- B. Two years should be sufficient to assess the desirability of having a full time nutritionist on the staff. The tasks that can already been seen - the ground work, literature development, data back up, and the amount of new information to be collected and analyzed are more than one staff member can complete in a two year period nor is that necessary. If AVRDC decides to continue and obtains core funds for a position, AID should consider added funding if needed.

C. During the second year of the project an evaluation will be carried out by AID assisted by consultants to assess the effect on the presence of a nutritionist in a. raising the level of nutrition concern on the part of participating countries, b. improving the AVRDC programs in crop and variety selection and screening aiming toward nutritional impact, c. and assessing the efficiency and effectiveness of this method of building a nutrition knowledge base in the region. Comparisons will be made with other methods in use at C.I.A.T., I.R.R.I. and others to ascertain whether added benefits can be associated with particular approaches.

PART II: PROJECT BACKGROUND AND DETAILED DESCRIPTION

A. Background

A review of program focus at the International Agricultural Research Centers shows that practically all of the research is pointed toward increasing yield. Only in corn, sorghum, and wheat programs has there been an attempt to improve nutrient content and/or nutrient availability. Opaque-2 corn has increased available protein by improving protein quality (better amino acid balance). Although this variety has been known for more than ten years its use is not wide spread because it lacks consumer acceptability and farmers find it un-economical to incorporate into their food production system. Now in the Center responsible for corn breeding (CYMMIT) acceptability factors are incorporated into the program to attempt to resolve the problem. It is the objective of this project to attempt to introduce nutrition/acceptability considerations early in the varietal nutritional impact of the Center's programs.

B. Detailed Description

Sector Goal: To improve the nutritional status of the poor and vulnerable groups.

Sub-Sector Goal: To introduce nutritional consideration into Agricultural planning and programming and policy.

Goal achievement will be measured by the extent of the adoption by the Center of nutritinal measures indicators and analyses as guides to genetics research programs and by the availability of more nutritional varieties for intorduction into national agricultrual programs.

OUTPUTS

1. Concurrence of AVRDC administration, the N.E.M. Program, and the temporary nutrition advisor on the content of a N.E.M. nutrition component and on how to achieve it on a continuing basis.
2. Core funding of a nutrition component at AVRDC.
3. Status reports on four locations bringing together the nutrition problem, the cropping characteristics, the opportunities for improvement, and recommendations for varietal introductions that should bring improvements health and economic welfare.
4. Field demonstration of an improved variety or cropping pattern showing improved economic welfare or health.

The basic assumptions are:

- A. AVRDC programs on vegetable improvement will contain a broad enough crop grouping to cover the significant nutritional problems of the region.
- B. That a two year period is long enough to demonstrate the potential of nutrition contributions, achievable by a regular nutrition staff member.
- C. That contributions of nutritionist through agriculture can have significant impact on the malnutrition of the region.

OUTPUT INDICATORS:

1. Country profiles of nutrient sources of food crops in the region
2. Country profiles of nutritional status and problems in region
3. Tables on income generating capacity of vegetable crops in relation to nutrient value
4. Estimates of genetic potential to increase nutrient content of important food crops
5. List of cultural and economic parameters important to adoption of new varieties and crops
6. Analyses and indicators of nutrient improvement incorporated into genetic research at AVRDC
7. Governments in the region informed of nutrition problems and of the potential to resolve them

INPUTS

1. The major input is to be the application of the nutritional disciplinary knowledge of the temporary staff provided in the project.
2. Funding to support the staff members and his activity.
3. Cooperation of local governments will be necessary to assemble an accurate picture of nutritional status, problems, and alternative solutions. AVRDC will serve as project managing institutions with Dr. Moomau as Administrator of the funds.
4. TA/N will be responsible for ongoing supervision and evaluation of programs of the project with the close communication and consultation of TA/AGR. Participating countries will be selected in collaboration with AID Missions and Regional Bureaus. Reviews of the project will be a regular part of <sup>/AVRDC's</sup> annual program review process and will include AID and consultant participation.

PART III: PROJECT ANALYSIS

A. Technical Analysis

The U.S. and other donors are making increased investments in international agricultural research in agricultural planning and programming and in nutrition programming. Since the ultimate goal of these investments is to provide information and resources to assist LDC populations to reach a higher quality of life, the role of nutrition in these investments becomes critical.

Methodologies to be used are well established, reliable, and straight forward. What remains to be done is to apply the methods and generate the data base to support the intergration of nutritional considerations in the food systems of the regional research and development program.

Technology and Employment Effects

The NEM program has its focus on the labor intensive, low cost technologies. Low energy farming practices of low capital intensity are also avoided. On the other hand maximum economic impact is sought within the small farm constraints of each region by selecting among crops, cultivars, marketing practices and policies to achieve maximum impact.

Environmental Effects

No direct environmental effects are expected during this project period. Long range benefits could accrue to the health environment if success is achieved. Pesticides are avoided when ever possible in AVRDC programs in order to minimize negative effects on environment.

B. Financial Analysis and Plan

1. Financial Rate of Return/Viability

A financial rate of return is not expected from this project. This is a non-revenue generating project that should over the long range improve the nutrition status of the general population; this itself may have production implications in the long range.

2. Recurrent Budget Analysis of Implementing Agencies

It is not expected that recurring U.S. expenditures will be required beyond the life of the project.

3. Financial Plan/Budget Tables

This project is to be carried out under a grant to AVRDC. The budget outlines expected costs by year and does not anticipate funding from other sources except for usual staff support and institutional overhead costs attributable to the staff activities. (The budget is shown in Table I.)

Summary

The general costs budgeted by AVRDC may prove to be low by U.S. Standards, a consideration to be dealt with in the specific negotiation for a suitable staff member.

Social Analysis

All activities under this project are tailored to the conditions of social milieu of the LDC's. All social-economic surveys are constructed to be compatible with the local environment. All demonstration projects will intervene with an improvement and any improvement introduced will not summarily be withdrawn. All activities carried out in the culture will be discussed and cleared with local officials prior to their initiation.

Economic Analysis

No direct economic impact is expected to occur as a result of this short-lived project. A purpose of the NEM overall program is to have an effect on the economic welfare of the small producers of the region but this is a long range program to which this project is unlikely to have an influence except that with less malnutrition in the environment better worker productivity could eventually occur.

PART IV: Analysis of Recipient and AID/Administrative Arrangements

1. Recipients

AVRDC is heavily dependent on AID at present and is making efforts to alter its dependency toward a more international funding base. In time AVRDC may need<sup>to</sup>/move to a more politically neutral territory in the region. in order to attract a broader funding base. Programatically the impending changes in location are not expected to have any effect on this two-year project.

2. AID

The project is expected to require:

10 days of DSB/N staff time in: FY 78

10 days in FY 78 and FY 79

The major DSB staff involvement will be to coordinate AVRDC activities with Asia Bureau and Mission personnel and programs, arrange for and participate in reviews and evaluations, and to disseminate findings.

### 3. Constraints

AVRDC will need continuous monitoring because of the breadth of expectations that may fall upon a single highly specialized individual.

### 4. Reports

Reports on each country will be prepared as well as crop and commodity progress reports. These will be compiled as an annual report each year for AID. A annual review of the project will be conducted by AID staff and consultants.

### Utilization

Utilization is expected to occur as 1) addition of a regular nutrition staff position at AVRDC and 2) each country report will be disseminated for use by donors in those countries and will be expected to form a basis for future nutrition development activities.

### Evaluation Plan

By the middle of the second year of the project TA/N and TA/AGR will carry out an evaluation of AVRDC progress. The first level to be examined will be the utility, adding a staff position in nutrition. The second level is to examine the crops being recommended to country program introductions for improved nutritional and food use characteristics. The next level is to ascertain the effect that the project has had on country programs. Finally a review will be carried out on what affect the nutrition presence may have had on the nutrition research programs at other Asian locations.

The purpose of each level of evaluation will be to ascertain the efficiency, effectiveness and significance of the project activities in contributing to the project purpose. The evaluation will specifically list the tasks that a staff member could be expected to perform on a continuing basis, the costs of doing this, and the extent of improvement in crop characteristics that it is reasonable to expect. Finally an estimate will be made of the attitude of the Center's administration toward the inclusion of nutritional concerns into the overall programs and in what way this might be improved.

Implementation Plan

Outline

January - June 1978

1. Project paper approved
2. Contract with AVRDC
3. Location of staff for AVRDC

June - December 1978

4. Location of personnel on site
5. Program plan review with AID
6. Initiate country surveys
7. Assemble tables and data

January - June 1979

8. Complete country surveys
9. Analyze data
10. Begin developing country profiles

June - December 1979

11. Develop building strategies
12. Develop followon work plans for staffing pattern
13. Review progress and submit report

3. Waivers

None required

BUDGET FOR SUPPORT OF NUTRITIONISTS AT AVRDC

	<u>YEAR I</u>	<u>YEAR II</u>
1. <u>Salaries</u>		
1 Full-Time Senior Professional	45,000	45,000
1 Local Professional ½ time	12,000	12,000
2. <u>Annual Leave Travel</u>		
(\$1,500 per staff and dependents per year)	3,000	3,000 <u>a/</u>
3. <u>Professional Travel</u>		
Accommodation 130 days (@ \$50/day)	6,500	6,500
Air Tickets	8,000	8,000
4. <u>Transporation of Personal Effects</u>	4,500	4,500
5. <u>Operational Costs and Supplies</u>	3,000	3,000
	<hr/>	<hr/>
	82,000	82,000

a/ Based on married couple without children.