

(FACE SHEET)

## ETHICAL REVIEW COMMITTEE, ICDDR,B.

Principal Investigator: Dr. Md. Yunus

Trainee Investigator (if any): \_\_\_\_\_

Application No. 98-030

Supporting Agency (if Non-ICDDR,B) \_\_\_\_\_

Title of Study: Evaluation of sustainability of education aimed at increased consumption of green leafy vegetables by young children and mothers in poor communities in rural Bangladesh.


Project Status: \_\_\_\_\_

- New Study  
 Continuation with change  
 No change (do not fill out rest of the form)

Circle the appropriate answer to each of the following (If Not Applicable write NA)

1. Source of Population:
- (a) Ill subjects Yes  No
- (b) Non-ill subjects  Yes  No
- (c) Minor or persons under guardianship  Yes  No
2. Does the Study Involve:
- (a) Physical risk to the subjects Yes  No
- (b) Social risk Yes  No
- (c) Psychological risks to subjects Yes  No
- (d) Discomfort to subjects Yes  No
- (e) Invasion of privacy Yes  No
- (f) Disclosure of information damaging to subject or others Yes  No
3. Does the Study Involve:
- (a) Use of records (hospital, medical, death or other) Yes  No
- (b) Use of fetal tissue or abortus Yes  No
- (c) Use of organs or body fluids Yes  No
4. Are Subjects Clearly Informed About:
- (a) Nature and purposes of the study  Yes  No
- (b) Procedures to be followed including alternatives used  Yes  No
- (c) Physical risk Yes  No NA
- (d) Sensitive questions Yes  No NA
- (e) Benefits to be derived  Yes  No
- (f) Right to refuse to participate or to withdraw from study  Yes  No
- (g) Confidential handling of data  Yes  No
- (h) Compensation &/or treatment where there are risks or privacy is involved in any particular procedure Yes  No NA
5. Will Signed Consent Form be Required:
- (a) From subjects Yes  No
- (b) From parents or guardian (if subjects are minor) Yes  No
6. Will precautions be taken to protect anonymity of subjects  Yes  No
7. Check documents being submitted herewith to Committee:
- \_\_\_ Umbrella proposal - Initially submit an with overview (all other requirements will be submitted with individual studies)
- Protocol (Required)
- Abstract Summary (Required)
- \_\_\_ Statement given or read to subjects on nature of study, risks, types of questions to be asked, and right to refuse to participate or withdraw) (Required)
- \_\_\_ Informed consent form for subjects
- \_\_\_ Informed consent form for parent or guardian
- \_\_\_ Procedure for maintaining confidentiality
- Questionnaire or interview schedule\*
- \* If the final instrument is not completed prior to review, the following information should be included in the abstract summary
1. A description of the areas to be covered in the questionnaire or interview which could be considered either sensitive or which would constitute an invasion of privacy
2. Example of the type of specific questions to be asked in the sensitive areas
3. An indication as to when the questionnaire will be presented to the Committee for review

We agree to obtain approval of the Ethical Review Committee for any changes involving the rights and welfare of subjects before making such change.



Principal Investigator

Trainee

Principal Investigator: Yunus Md.

International Centre for Diarrhoeal Disease Research, Bangladesh

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## RESEARCH PROTOCOL

Protocol No:

Date:

RRC Approval: Yes/No

Date:

ERC Approval: Yes/No

Date:

1. Title of Project: Evaluation of sustainability of education aimed at increased consumption of green leafy vegetables by young children and mothers in poor communities in rural Bangladesh

2a. Name of the Principal Investigator(s)  
(Last, Middle, First).

Yunus Md.

Alam S. Dewan

Professor Patrick J. Vaughan

Baqi A.H.

2b. Position/Title

Scientist and Head  
MHRP, PHSD, ICDDR,B

Sr. Medical Officer  
MHRP, PHSD, ICDDR,B

Professor  
London School of Hygiene  
and Tropical Medicine

Acting Division Director  
PHSD, ICDDR,B

2c. Qualifications

MBBS, M.Sc.(CHDC)

MBBS, M.Med.Sc

MD, FRCPE

MBBS, MPH, Dr.PH

3. Name of the Division/Branch/Programme of ICDDR,B under which the study will be carried out.  
'Public Health Sciences Division/Matlab Health Research Programme'

4. Contact Address of the Project Investigator

4a. Office Location:  
ICDDR,B

4b. Fax No: 880-2-886050

4c. E-mail: myunus@icddr.org

4d. Phone/Ext: 871751-60/2210

5. Use of Human Subjects

Yes

No

5a. Use of Live Animal

Yes

No

5b. If yes, Specify Animal Species

'Not applicable'

6. Dates of Proposed Period of Support

(Day, Month, Year - DD/MM/YY)  
'1 year from the start'

7. Cost Required for the Budget Period

7a. 1<sup>st</sup> Year (\$): 20,000 2<sup>nd</sup> Year (\$): 3<sup>rd</sup> Year:

7b. Direct Cost (\$): 20,000 Total Cost (\$) 20,000

8. Approval of the Project by the Division Director of the Applicant

The above-mentioned project has been discussed and reviewed at the Division level as well by the external reviewer. The protocol has been revised according to the reviewer's comments and is approved.

Dr. Andres de Francisco

Name of the Acting Division Director

  
Signature

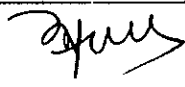
8/11/98.  
Date of Approval

9. Certification by the Principal Investigator

I certify that the statements herein are true, complete and accurate to the best of my knowledge. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. I agree to accept responsibility for the scientific conduct the project and to provide the required progress report if a grant is awarded as a result of the application.

10. Signature of PI

Date:

  
8/11/98

Principal Investigator: Yunus Md.

## PROJECT PROPOSAL - SDC FUNDING

Title: Evaluation of sustainability of educational intervention aimed at increased consumption of green leafy vegetables by young children and mothers in poor communities in rural Bangladesh

Principal Investigators : Dr. Md. Yunus, MBBS, M.Sc. (CHDC)  
Scientist and Head,  
Matlab Health Research Programme  
Public Health Sciences Division (PHSD)  
ICDDR,B, Dhaka-1000, Bangladesh

: Dr. Dewan S. Alam, MBBS, M.Med.Sc  
Sr. Medical Officer  
Matlab Health Research Programme  
PHSD, ICDDR,B

: Professor Patrick J. Vaughan, MD, FRCPE  
Professor  
London School of Hygiene  
and Tropical Medicine

: Dr. A.H. Baqui, MBBS, MPH, Dr.PH  
Acting Division Director  
PHSD, ICDDR,B

Consultant : Dr. K.M.A. Aziz, Ph.D.  
Visiting Scientist, PHSD

Country : Bangladesh

Total funding sought : US\$ 20,000 over one year

Funding source : Request to SDC

Duration of project : 1 year

## Project Summary

Nutritional blindness due to vitamin A deficiency has been recognized for many years as a major public health problem in Bangladesh and other developing countries. Besides blinding malnutrition, vitamin A deficiency is associated with increased morbidity and mortality in children. Despite the programme of biannual distribution of high dose vitamin A capsule to young children vitamin A malnutrition continues to be a serious public health problem in Bangladesh. Other intervention such as nutrition education to promote increased consumption of B-carotene rich foods specially green leafy vegetables and yellow fruits is of paramount importance. In Bangladesh, carotenoid containing foods of vegetable origin are usually excluded from the diet of young children during the vulnerable period of weaning and post-weaning through the pre-school ages due to wrong perception. Education and motivation to the mothers of young children on proper dietary management may be very crucial for overcoming the problem of Vitamin A deficiency in children.

An educational intervention project, with repeated nutrition education aimed at improving cooking procedures and increasing consumption of B-carotene rich vegetables and fruits by young children and mothers, was conducted in Matlab for one year during May 1994 to April 1995. In this study two sets of villages were selected: one as intervention area and another as comparison. One hundred sixty households, each with a mother and an index child aged 6 - 59 months, had been randomly selected from each of the intervention and comparison area. Households in both intervention and comparison areas were selected from very low socio-economic level. Bi-monthly educational intervention over a period of one year on cooking procedures and intake of B-carotene rich vegetables as well as fruits, was given to mothers of index children in small groups in the intervention area only. Baseline and follow up surveys were: 6 monthly KAP and in-depth interviews, quarterly participant observations, and bi-monthly 24-hour and 3-day dietary recall surveys. These surveys were conducted in both the intervention and comparison areas. Evaluation after one year showed significant improvement in cooking procedures, and increase in consumption of vegetables rich in B-carotene by both index children and the mothers. These were very important findings and may lead to self reliance in the development of adequacy of vitamin A intake and in improving the situation of blinding malnutrition in Bangladesh provided that the impacts are sustained. The effectiveness of health education intervention, especially its sustainable impact, has been debated, but follow up studies to assess long term impacts following discontinuation of intervention are sparse. We propose to conduct a follow up study to investigate the issue of sustainability of positive impact three years after the termination of the one year nutrition intervention project.

The objective of the proposed study is to evaluate the sustainability of nutrition education strategy aimed at improved preparation, and increased consumption of B-carotene rich vegetables and fruits by young children and mothers as a source of vitamin A in poor communities of rural Bangladesh.

The study will be carried out at the field research area of Matlab. The 160 households with very low socio-economic condition having one child aged 6-59 months which were previously included in an intensive educational intervention aimed at improved preparation and increased consumption of vegetables and fruits rich in  $\beta$ -carotene, and another 160 households of similar socio-economic status with one child aged 6-59 months which served as controls, will be included in this study. In the event of any index child becoming older than 5 years, then another baby born in it in the post-intervention period and attaining 6 months of

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age or more will be included as a replacement in the study. If no child is available for such replacement or any original household no longer being available, a neighbouring household with a child fulfilling the age and sampling criteria (see background) will be considered for inclusion.

A Knowledge Attitude and Practice (KAP) survey and in-depth interview will be conducted on all the selected households. Participant observation for 8-hour will be done on all households on the composition of meal under preparation, cooking process, types and quantity of foods being served and consumed by the target children and mothers. Dietary recall survey will be undertaken to inquire about frequencies, quantities and types of meals served and consumed during the past 24 hours and 3 days, once at the beginning of the study and will be repeated after 3 months to account partially for the seasonal variation in the availability of the promoted leafy vegetables as was done in the original study.

All the collected data will be compared with the findings of the original study to ascertain the sustainability in terms of knowledge, perception, cooking and consumption of green leafy vegetables.

The proposed study will provide new information concerning sustainability of impacts of nutrition education programme in combating vitamin A deficiency in communities where the major part of vitamin A comes from plant sources.

## **DESCRIPTION OF THE RESEARCH PROJECT**

### **Hypothesis to be tested:**

Nutrition education intervention attaining increased consumption of  $\beta$ -carotene rich foods in rural Bangladesh is sustainable in the post intervention period.

### **Specific Aim:**

To evaluate the sustainability of a nutrition education strategy aimed at improved preparation, and increased consumption of  $\beta$ -carotene rich vegetables and fruits by young children and mothers as a source of vitamin A in poor communities of rural Bangladesh.

## **Background of the Project including Preliminary Observations**

### **Background:**

Vitamin A deficiency is one of world's most serious public health problems. This deficiency is known to be the main cause of preventable childhood blindness. An estimated ten million children under the age of six years develop some degree of xerophthalmia worldwide and about a million go blind (Habte 1989).

Nutritional blindness due to vitamin A deficiency has been recognized for many years as a major public health problem in Bangladesh (Kamel 1972-73, Ahmed and Hasan 1983, Institute of Public Health Nutrition and Helen Keller International-1985, Cohen et al 1986, Hussain et al. 1993). Vitamin A deficiency is also a major cause of morbidity and mortality in children (Sommer et al 1983, Sommer, Kartz and Tarwatjo 1984). Considering the importance of Vitamin A in preventing blinding malnutrition and its role in child survival, Bangladesh with the support of UNICEF has initiated a programme of periodic massive-dose

of vitamin A supplementation to young children. Despite this programme of supplementation, vitamin A malnutrition continues to be a serious public health problem in Bangladesh affecting thousands of pre-school children (Cohen et al 1987, Abdullah and Malek 1989). Pereira and Begum (1969) reported that single doses of vitamin A are unable to maintain adequate serum vitamin A levels in vitamin A - depleted-children after three or 4 months. They also observed that after a massive dose of vitamin A, children on a low carotene diet developed conjunctival xerosis and children on a moderate carotene diet did not derive any additional benefit. This observation underscores the paramount importance of increased intake of carotene-rich foods by young children in the prevention and control of vitamin A deficiency. Several studies have reported that in Bangladesh and many other developing countries vegetables are the major sources of B-carotene (Zeitlyn et al 1992, Rahman, Wahed & Ali 1990, Simpson 1983, Vinod and Vinodini 1970). It has also been reported that only 40 g of green leafy vegetables (GLV) cooked with 39 ml of oil provides the recommended daily allowance (RDA) of vitamin A precursors (Vinod & Vinodini 1970, World Health Organization 1967). Under such situation efforts must be made to undertake possible measures in promoting the intake of vegetables and fruits rich in  $\beta$ -carotene.

Since 1988, Helen Keller International (HKI) has been implementing community home-gardening promotion projects in Bangladesh. The overall goal of HKI's projects are to reduce the incidence of nutritional blindness among marginal and landless peasant families through the cultivation of homestead vegetables and fruits rich in  $\beta$ -carotene, and education concerning the importance of vitamin A in diet. Nonetheless, there is some questions as to whether home-gardening leads to a higher intake of provitamin A or whether the fruits and vegetables produced are mainly sold to generate income for the household. Furthermore, the potentiality of the replication of the procedures applied and found workable remain unclear. Overall evaluation of the HKI's home gardening promotion approach is currently in progress by the ICDDR,B (Fuchs G & Khan M, 1997). Recently Bloem et al (1996) from analyses of baseline data collected from the HKI home-gardening monitoring system has reported very promising results regarding intake of vitamin A by women of reproductive age from the consumption of fruits and vegetables. Vitamin A precursor carotenoid can be found in dark green leafy vegetables, yellow and red fruits, yellow cereals and tubers, yellow citras and red palm oil which are widely available in many parts of the world. These forms of vitamin A costs less than animal products. Carotenoid containing foods of vegetable origin are usually excluded from the diet of young children during the vulnerable period of weaning and postweaning through the pre-school years. In a study conducted in a village of Matlab Sub-district (Khan 1980) found that before 15 months none of the children was given vegetables. Causes which contribute to vitamin A deficiency include among others, lack of knowledge on  $\beta$ -carotene rich foods, and wrong beliefs causing inadequate intake of vitamin A rich foods (HKI- IPHN 1985, Ahmed and Hassan 1986, Damton-Hill 1989). Poverty and low socio-economic status are important risk factors for vitamin A deficiency (Cohen 1989). In addition, inappropriate processing and cooking procedures including prolonged cooking of vegetables cause loss of  $\beta$ -carotene (Edib 1979, Quddus 1984, Rahman, Wahed, Ali 1990).

Education and motivation to the mothers and care-givers of young children on proper dietary mangement may be very crucial in overcoming these problems. Health and nutrition education including a feeding demonstration delivered to the mothers at the time of visit to a diarrhoea hospital with their children showed that infants and children can eat enough GLV

when fed by mothers under the supervision of health personnel in a treatment centre setting (Rahman et al 1993). A follow up study at home after 8 weeks suggested that health education has a positive impact on mothers to feed their children GLV and should be considered in programmes aiming at alleviating vitamin A deficiency (Rahman et al 1994).

An educational intervention project with repeated nutrition education aimed at improving cooking procedures and increasing consumption of B-carotene rich vegetables and fruits by young children and mothers was conducted in Matlab for one year during May 1994 to April 1995 (Aziz et al 1992). In this study two sets of villages were selected: one as intervention area and another as comparison. One hundred sixty households, each with a mother and an index child aged 6 - 59 months, had been randomly selected from each of the intervention and comparison area. Households in both intervention and comparison areas were selected from very low socio-economic level. The criteria for selection of households were: the mothers without any formal schooling, cultivable land less than half an acre, household garden space less than half the size of the main living area and have no working radio or watch. Bi-monthly educational intervention over a period of one year on cooking procedures and intake of B-carotene rich vegetables as well as fruits was given to mothers of index children in small groups in the intervention area only. Baseline and follow up surveys were: 6 monthly KAP and in-depth interviews, quarterly participant observations, and bi-monthly 24-hour and 3-day dietary recall surveys. These surveys were conducted in both the intervention and comparison areas. Evaluation after one year showed significant improvement in cooking procedures, and increase in consumption of vegetables rich in B-carotene by both index children and the mothers (Yunus et al 1996, Aziz et al 1996).

The outcome of this intervention project revealed that education and motivation to mothers and caregivers of young children have played a crucial role in increasing the consumption of green vegetables by changing the wrong beliefs which earlier caused inadequate consumption of vitamin A rich vegetables. Through education intervention a significant change in the composition of normal diet of young children and their mothers through the inclusion of green vegetables has occurred. Adaptation to any dietary habit is considered to be difficult. In spite of such a background this project had showed that adaptation to recommended diet by young children and their mothers representing very poor socio-economic group has occurred in the intervention area following delivery of bi-monthly educational messages over a period of one year. These were very important findings and may lead to self reliance in the development of adequacy of vitamin A intake and in improving the situation of blinding malnutrition in Bangladesh provided that the impacts are sustained. The effectiveness of health education intervention, especially its sustainable impact, has been debated, but follow-up studies to assess long term impacts following discontinuation of intervention are sparse. Hussain and Kvale (1996) reported inconclusive results on sustainable impact of a nutrition education programme to prevent night blindness after 3 years post intervention. The one-year nutrition intervention project conducted in Matlab by Aziz et al (1992) during 1994 to 1995 offers a unique opportunity to test the issue of sustainability of its positive impacts three years after the termination of educational interventions as all the households in the original study can be identified and located through the Matlab Demographic Surveillance System. Therefore, we propose to undertake an evaluation of sustainability of educational intervention aimed at increased consumption of green leafy vegetables by young children and mothers in poor communities in Matlab. The proposed study will provide new information concerning sustainability of impacts of nutrition

education programme in combating vitamin A deficiency in communities where the major part of vitamin A comes from plant sources.

## **Research Design and Methods**

### **Methods and Procedure:**

The study will be carried at the Matlab field research area of ICDDR,B, where a longitudinal Demographic Surveillance System (DSS) has been in operation since 1966 in a current population of about 210,000. The 160 households with very low socio-economic condition having one child aged 6-59 months which were previously included in an intensive educational intervention aimed at improved preparation and increased consumption of vegetables and fruits rich in  $\beta$ -carotene, and another 160 households of similar socio-economic status with one child aged 6-59 months which served as controls, will be included in this study. In the event of any index child becoming older than 5 years, then another baby born in it in the post-intervention period and attaining 6 months of age or more will be included as a replacement in the study. If no child is available for such replacement or any original household no longer being available, a neighbouring household with a child fulfilling the age and sampling criteria (see background) will be considered for inclusion.

The baseline and follow up surveys in the original study were: 6-monthly KAP and in-depth interviews, quarterly participant observation, and bi-monthly 24-hour and 3-day dietary recall. These surveys were conducted in both the intervention and comparison areas by locally recruited female field workers who received on the job training. Attempts will be made to hire the field workers for this project from those who worked in the original project. They will be blinded as to the original interventions in the family they are interviewing.

A Knowledge Attitude and Practice (KAP) survey and in-depth interviews concerning vitamin A deficiency especially nightblindness and the importance of intake of green leafy vegetables by young children in preventing nightblindness will be conducted on all households. One round of participant observation for 8-hours will be done covering the meal taking of the index child and its mother by the field workers on all households. Observations will be made on the composition of meal under preparation, cooking process, types and quantity of foods being served and consumed by the target children and mothers. Special attention will be paid to the preparation and consumption of green leafy vegetables. The social context and verbal interactions during feeding of the child and eating by the mother will be recorded. The relationship of every household members with the target child in the context of child feeding and food intake by the mother will be examined. During the participant observation the feeding pattern of the child and the eating pattern of the mother will be examined within the context of the homestead. Guidelines on participant observation of dietary practices is shown in appendix-1. Dietary recall survey will be undertaken to inquire about frequencies, quantities and types of meal served and consumed by the children during the past 24 hours and the past 3 days once at the beginning of the study. This survey will be repeated after 3 months which will account partially for the seasonal variation on the availability of the promoted vegetables. The instruments used in the original study will also be used in this study. The KAP, 24-hour and 3-day dietary recall instruments are shown in appendix 2 and 3 respectively. Comprehensive quantitative assessment of dietary vitamin A and provitamin A carotenoids intake will be assessed using similar dietary intake assessment methodology used in the original study.



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Once the KAP survey, participant observation, and 24-hour dietary recall survey are completed ethnographic interview will be undertaken. This method will be used to explore explanations and views of the study population to understand the reasons regarding difference in sustainability with respect to procurement, procedures of preparation and cooking, and consumption of vegetables by the index child and mother.

In this study both quantitative and qualitative research methods will be used. The level of awareness regarding the importance of B-carotene rich vegetables & fruits will be assessed through in-depth interviewing.

Data collection in the field will be completed over a period of 6 months. Training and supervision of the field workers will be conducted by a research officer having nutrition background and a senior health assistant having social science background, and work experience in a community based nutrition project.

### **Sample size:**

Since the proposed study is a follow up of earlier intervention study to assess sustainability, the original households, and the sample size (160 households in each of the intervention and comparison area) as already mentioned under "Methods and Procedures" will be retained (Aziz et al, 1992).

### **Methods to ensure data quality:**

To ensure data quality, the following steps will be taken:

- i) The field workers will be provided with adequate training.
- ii). The study supervisors and the Principal Investigator will make routine visits to the field including random spot checks.
- iii) A 5% sample of study subjects will be re-interviewed and re-assessed within one day of the original interview and assessments.

### **Data Management:**

All questionnaires and data forms will be reviewed by the Principal Investigators and the Study Supervisor for accuracy, completeness and consistency. Whenever necessary, the field workers and the supervisor will make additional field visits to collect missing information or clarify/correct inconsistencies. After editing the data will be entered using appropriate data entry programme. Necessary range and consistency checks will be in-built in the data entry programme. Data will be periodically checked by running and reviewing frequency distributions and cross-tabulations.

### **Data Analysis:**

From the quantitative study the frequency and quantity of consumption will be available providing a definitive response on this topics. Whereas the qualitative information obtained through the participant observation as well as through open ended questions administered in the KAP and dietary recall surveys will provide depth of understanding and insights in the vegetable consumption behaviour. The qualitative studies will provide information on the motivations behind the choice of various types of leafy vegetables and fruits. The validity of the information obtained through the stated methods will be determined through triangulation. Frequency of intake of leafy vegetables by the mothers and their children will be presented in tabular form for 24-hour as well as 3-day recall period. The quantity of vegetable intake in the meals of mother and children during the 24-hour and 3-day recall period will be assessed and presented in tabular form. The

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frequency and quantity of intake of vegetables in the meals during 8 hours participant observation period will be presented keeping in view the seasonal variations. Preparation and cooking process of vegetable recorded through observation will be systematically analysed following the technique of content analysis. All the collected data will be compared with the findings of the original project to ascertain the sustainability in terms of knowledge, preparation, cooking and consumption of green leafy vegetables.

#### **Facilities available:**

ICDDR,B has maintained a field research area in Matlab since 1963 originally developed for field evaluation of cholera vaccines and conducting epidemiological studies in diarrhoeal disease. Over the years the spectrum of activities in Matlab has been widened covering wider aspects of public health issues including reproductive and child health and nutrition. To support field studies a primary care centre for management of diarrhoea since its inception and later for other common illnesses of mother and children from an intervention area has been functioning. A longitudinal Demographic Surveillance System (DSS) established in 1966 is currently operational in 142 villages containing about 210,000 population. Through these activities a good rapport has been established with the community in the surveillance.

#### **Ethical Assurance for Protection of Human Rights:**

This study will collect data by in-depth interviewing and observations. These do not include any sensitive query that can be considered as invasion of privacy. Informed consent will be obtained before undertaking these interviews and observations. The field workers will be from the local area who are familiar with local customs and norms, and will interact sensitively with the mothers keeping the above points in mind.

#### **Study Schedule:**

- |               |   |
|---------------|---|
| First month   | : Recruit and train staff, locate the households and identify the mothers and the children in the villages of the original study; enroll new subjects as mentioned in the method. |
| Next 6 months | : Field data collection and preliminary data checking.  |
| Next 3 months | : Data entry, cleaning and preliminary analysis.  |
| Next 2 months | : Final data analysis and report preparation.   |

#### **Responsibilities of Principle Investigators:**

Dr. Md. Yunus will have overall responsibility for the project, all the activities that will be undertaken in the field as well as at the office will be under his direct control and management.

Dr. Dewan S. Alam will be responsible to contribute in respect of analysis of data specially in respect to nutritional aspects.

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Prof. J. Patrick Vaughan will be responsible to contribute in respect of public health aspect of the issues that are addressed in the protocol.

As a consultant Dr. K.M.A. Aziz will be responsible to contribute on the aspects of undertaking qualitative studies and especially with reference to behavioral issues in vegetable consumption.

#### Dissemination and use of findings:

The findings of this study would be disseminated by presenting scientific papers in national and international conferences and workshops. Attempts will be made to publish papers in scientific journals for the purpose of dissemination among the scientific community and policy makers. Final report will also be forwarded to policy makers and programme managers in addition to the donor for the use of the findings.

#### Literature Cited:

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**Detailed Budget for New Proposal**

Project Title: Evaluation of sustainability of education aimed at increased consumption of green leafy vegetables by young children and mothers in poor communities in rural Bangladesh

Name of Pis: 1. Dr. Md. Yunus, MBBS, M.Sc (CHDC)  
2. Dr. Dewan S. Alam, MBBS, M.Med.Sc  
3. Professor Patrick J. Vaughan, MD, FRCPE  
4. Dr. A.H. Baqui, MBBS, MPH, Dr.PH

Protocol Number: Name of Division: Public Health Sciences Division

Funding Source: Request to SDC Amount Funded (direct): 20,000 Total: 20,000  
Overhead (%)

Starting Date: As soon as approved Closing Date: 1 year from the start

Strategic Plan Priority Code(s): 14-Nutrition; 93-Epidemiology; 95-Social & Behavioral Science

Sl.No	Account Description	Salary Support				US \$ Amount Requested
		Position	Effort%	Salary	Month	
1.	Dr. Md. Yunus	Scientist/Head, MHRD	15%	2,069	8	2,482
2.		Research officer (Nutritionist)	100%	300	8	2,400
3.		Sr. Health Assistant	100%	228	8	1,824
4.		Data Processing Assistant	100%	228	4	1,140
5.		Field workers	900%	80	7	5,440
6.		Clerk/DET	100%	175	7	1,225
	<b>Sub Total</b>					<b>14,511</b>
	Consultants					1,000
	Local Travel					100
	International Travel					1,200
	<b>Sub Total</b>					<b>2,300</b>

<b>Supplies and Materials (Description of Items)</b>	
Office Supplies Stationeries etc.	289
<b>Sub Total</b>	<b>289</b>
<b>Other Contractual Services</b>	
Repair and Maintenance	-
Rent, Communications, Utilities	100
Training Workshop, Seminars	100
Printing and Publication	100
Staff Development	-
<b>Sub Total</b>	<b>300</b>
<b>Interdepartmental Services</b>	
Computer	500
Pathological Tests	-
Microbiological Tests	-
Biochemistry Tests	-
X-Rays	-
Patients Study	-
Research Animals	-
Biochemistry and Nutrition	-
Transport	2,000
Xerox, Mimeographs etc.	100
<b>Sub Total</b>	<b>2,600</b>
<b>Other Operating Costs</b>	-
<b>Capital Expenditure</b>	
<b>TOTAL DIRECT COST</b>	<b>20,000</b>

## Appendix - 1

### Guidelines on 8-hourly participant observation of dietary practices.

An eight hour observation period of dietary practices will be done monthly. The observer will be present at the home from 7 a.m. to 3 p.m. in the evening. Due to logistical reason, the observer will not be able to observe the evening meal as it is normally taken around 7 p.m. Similar to the dietary recall, the observer will record all the foods including breastmilk consumed during the observation period. She will be equipped with a pre-designed checklist to record the following:

- the preparation and the cooking methods of vegetables
- the addition of oil to the vegetables
- all foods eaten during the period of observation
- the time the food was eaten
- the mixing of rice with the vegetable torkari when feeding the child
- the portion of the food which was vegetables
- the types of vegetables which were eaten.

In the preparation and cooking of the vegetables, she will note if the vegetables are washed before cooking; cooking duration of the vegetables; style of cooking the vegetables, i.e. boiled, steamed or fried; water from the cooked vegetables retained or discarded; and if the vegetables were cooked in a covered or an uncovered pot. The checklist will have all the various serving utensils which are found in rural home.

The observer will be careful to offer no comment on the preparation and cooking of vegetables or on the serving of the vegetables to children.

Appendix - 2  
KAP Questionnaire

Information to be collected from the mother/care-giver):

Village name: \_\_\_\_\_ Pre-test component \_\_\_\_\_ Education strategy implementation component \_\_\_\_\_  
 Name of mother \_\_\_\_\_ Age \_\_\_\_\_ Marital status \_\_\_\_\_  
 Id. No. \_\_\_\_\_  
 Father's occupation \_\_\_\_\_ Education: Father \_\_\_\_\_ Mother \_\_\_\_\_  
 Family income/month, Tk \_\_\_\_\_  
 Presence of working watch or radio in the household? Yes \_\_\_\_\_ No \_\_\_\_\_  
 Access to less than half an acre of land: Yes \_\_\_\_\_ No \_\_\_\_\_  
 A household garden smaller than half the size of the main living area:  
 Yes \_\_\_\_\_ No \_\_\_\_\_

Information on children (6m-59m):

Name	Id No.	Age/DOB	Birth order	Currently breastfed	Previously breastfed
				Yes/No (Months)	Yes/ No
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

If any child in the household is blind or suffers from night blindness?  
 Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, Age/DOB \_\_\_\_\_ Sex \_\_\_\_\_ Duration of illness: \_\_\_\_\_

Has the child difficulty in vision in dim light or at dusk?  
 Yes \_\_\_\_\_ No \_\_\_\_\_

Does the child stumble in late afternoon twilight or grope for objects in a dim light?  
 Yes \_\_\_\_\_ No \_\_\_\_\_

Has any practitioner been consulted for this ailment? Yes \_\_\_\_\_ No \_\_\_\_\_  
 If yes, specify the type of practitioner: \_\_\_\_\_

Can the respondent (mother, other specify relationship to the child) name any foods that may help in preventing blindness?  
 Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, what are they? \_\_\_\_\_

If any child in the household received any vitamin A capsule?  
 Yes \_\_\_\_\_ No \_\_\_\_\_

How is a vitamin A capsule administered? \_\_\_\_\_

Does the respondent know what the vitamin A capsule is for?  
 Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, state what? \_\_\_\_\_ Source of information \_\_\_\_\_



Appendix - 2 (Cont.)

What is the usual type of milk given to children from 12 months to 2 years of age?

- \* Breast milk
- \* Animal milk
- \* Commercial formula
- \* Type of milk given to the ego (study child) : \_\_\_\_\_

What breast feeding practices are followed?

- \* Are other foods or drinks routinely given to breast-fed infants below 12 months of age? \_\_\_\_\_ What about ego? \_\_\_\_\_
- \* When is breast-feeding stopped? \_\_\_\_\_ What about ego? \_\_\_\_\_
- \* Why is it stopped? \_\_\_\_\_ Why in the event of ego? \_\_\_\_\_
- \* How is it stopped? \_\_\_\_\_ How in the event of ego? \_\_\_\_\_

How are breast milk substitutes used?

- \* What foods are used (e.g. animal milk, commercial infant formula)? \_\_\_\_\_ How about ego? \_\_\_\_\_
- \* How is the food prepared? Is it diluted? Is hygiene good? What about ego? \_\_\_\_\_
- \* What feeding utensils are used (e.g. feeding bottle and teat, cup and spoon)? What about ego? \_\_\_\_\_

What weaning practices are followed?

- \* At what age are weaning foods (soft and semi-solid foods) introduced? What about ego?
- \* What foods are used? What about ego?
- \* How are they prepared? Was/is it applicable for ego? \_\_\_\_\_  
If otherwise, describe \_\_\_\_\_

What foods are available and are they:

- † common?
- † affordable
- † easily digestible?
- † culturally acceptable?
- \* B-carotene-rich?

Do the available foods contain important nutrients, especially B-carotene?

Are vegetables (specify: \_\_\_\_\_) eaten by the mother of the child and ego ---- Frequency of eating by mothers \_\_\_\_\_ by ego \_\_\_\_\_

If the reply is affirmative, what is the source(s) of advice for such intake? \_\_\_\_\_

Appendix - 2 (Cont.)

What do people believe about B-carotene rich foods and diseases such as: night blindness?

- \* How are foods classified locally?
- \* Which foods are believed to cause night blindness and why
- \* What other causes of this disease are believed to exist?

What are the symptoms of night blindness?  
How blindness can be prevented and treated?  
What are the usual feeding practices during night blindness?

- \* Is breast-feeding continued, done less frequently or stopped?
- \* Is food intake restricted?
- \* If so, is restriction complete or partial and how long does it continue?
- \* Are any food avoided during night blindness? If yes, name them:
- \* Is any foods recommended? If yes, when are they given, how much is given and how are they prepared?
- \* Breast-feeding status: Yes \_\_\_ No \_\_\_, Exclusive B.F. (no water. --- Predominantly breastfed (no other milk or food) but water, honey, misri acceptable ---
- \* In the event of night blindness any foods and feeding methods are specifically advised by any of the sources such as, family members, local health workers including doctors and traditional practitioners, mass media like radio, TV, poster.
- \* To cure night blindness are any other treatments used (e.g. herbal remedy, magical methods, etc.)
- \* Age of introduction of food items in the diet of the ego:
- \* Other milk \_\_\_\_\_
- \* vegetables (specify type: \_\_\_\_\_)
- \* rice and wheat as a liquid or semisolid preparation
- \* supplementation of rice and bread
- \* supplementation of fish --- , meat --- , or eggs ---  
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Blood sample obtained: Yes \_\_\_\_\_ No \_\_\_\_\_  
(Day/Month/year)

Interview done by: \_\_\_\_\_

Date of interview: \_\_\_\_\_

Day Month Year



Appendix - 3 (Cont.)

Foods consumed by the child (ego) during the last 24 hours:

Categories of foods

Frequency/24 hours  
Servicing size (spoonful/cup/g etc)

Green leafy vegetables:

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Yellow vegetables:

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Yellow Fruits:

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Interview done by \_\_\_\_\_

Date of interview \_\_\_\_\_

Day    Month    year

Title: Evaluation of sustainability of educational intervention aimed at increased consumption of green leafy vegetables by young children and mothers in poor communities in rural Bangladesh

Summary of Referee's Opinions: Please see the following table to evaluate the various aspects of the proposal by checking the appropriate boxes. Your detailed comments are sought on a separate, attached page.

	Rank Score		
	High	Medium	Low
Quality of Project	✓		
Adequacy of Project Design		✓	
Suitability of Methodology		✓	
Feasibility within time period	✓		
Appropriateness of budget			
Potential value of field of knowledge	✓		

D.12

CONCLUSIONS

I support the application:

- a) without qualification
- b) with qualification
  - on technical grounds
  - on level of financial support

I do not support the application

Name of Referee: A.M.R. Choudhury  
 Signature: [Signature] Date: 29/10/98  
 Position: Director Research  
 Institution: ICR  
 Detailed Comments: attached

Please briefly provide your opinions of this proposal, giving special attention to the originality and feasibility of the project, its potential for providing new knowledge and the justification of financial support sought; include suggestions for modifications (scientific or financial) where you feel they are justified.

(Use additional pages if necessary)

Title: Evaluation of sustainability of educational intervention aimed at increased consumption of green leafy vegetables by young children and mothers in poor communities in rural Bangladesh.

PI:

Reviewer:

  
.....

This study will identify green leafy vegetable consumption from the point of view of sustainability through quantitative as well as qualitative methods of investigation. The variations in relation to sustainability have to be explained by pointing out differences in the socio-cultural characteristics of the individual and immediate household group members as well as other kinbased separate familial units within the lineage (*bari*) group. The relationship of every household member with the target child, in the context of child feeding and food intake by the mother have to be examined. These are crucial as the young children after reaching the walking and moving stage increasingly move around within the homestead or *bari* representing the kin based familial groups associated with the child. In every *bari* the young children are the major focus for expression of affection. This is frequently expressed by sharing food that may be dry as well as cooked. It is suggested that during the participant observation the feeding pattern of the child and the eating pattern of the mother within the homestead context be examined.

The social context and verbal interaction at the time of recording feeding will be helpful in identifying the reasons for feeding and eating the vegetables by the target child or the mother.

It may also be of interest to the investigators to examine the 'dissemination' of the knowledge to other households. In doing this, the investigators may wish to sample additional households from the same village but where no instruction was given.

Another methodological point. The investigators plan to do participant observations. This is very good. However, instead of doing it only for a 8-hour day, they may wish to repeat it for at least three consecutive days. This may offset the effect of the very presence of the observer.

Title: Evaluation of sustainability of educational intervention aimed at increased consumption of green leafy vegetables by young children and mothers in poor communities in rural Bangladesh

Summary of Referee's Opinions: Please see the following table to evaluate the various aspects of the proposal by checking the appropriate boxes. Your detailed comments are sought on a separate, attached page.

	Rank Score		
	High	Medium	Low
Quality of Project	✓		
Adequacy of Project Design	✓		
Suitability of Methodology	✓		
Feasibility within time period	✓		
Appropriateness of budget	✓		
Potential value of field of knowledge	✓		

CONCLUSIONS

I support the application:

- ✓ a) without qualification +-----+  
✓-----+
- b) with qualification +-----+
- on technical grounds +-----+
- on level of financial support +-----+

I do not support the application +-----+  
+-----+

Name of Referee: H.K.S. Arefeen

Signature: H.K.S. Arefeen ..... Date: 2/11/98 .....

Position: Professor and Chairman, Dept. of Anthropology,

Institution: University of Dhaka

Detailed Comments



Please briefly provide your opinions of this proposal, giving special attention to the originality and feasibility of the project, its potential for providing new knowledge and the justification of financial support sought; include suggestions for modifications (scientific or financial) where you feel they are justified.

(Use additional pages if necessary)

Title: Evaluation of sustainability of educational intervention aimed at increased consumption of green leafy vegetables by young children and mothers in poor communities in rural Bangladesh.

PI:

Reviewer: The proposed project is interesting and will be a.... contribution in applied anthropology, particularly in the areas of medical and nutritional anthropology. In addition to providing data on food/culture of the locality, this project will help internalise the knowledge and importance of intake of green leafy vegetables in preventing malnutrition, vis-a-vis blindness.

*H.K.S. Arefeen*

2.11.98

**DR H.K.S. AREFEEN**  
Professor & Chairman  
Department of Anthropology  
University of Dhaka.

## **Response to external reviewers:**

### **Reviewer No.1:**

This reviewer stated that the variations in relation to sustainability have to be explained by pointing out differences in socio-cultural characteristics of the individual and immediate household members as well as other kinbased separate familial units within the lineage (bari) group.

Response - As already mentioned in the methods and procedures that the target households in which educational intervention was given for increased consumption of green leafy vegetables by young children and mothers belonged to very low socio-economic group. The objective of the proposed study is to evaluate the sustainability of the positive impacts of the nutrition education among those households only three years after the termination of the intervention. We agree that there might exist differences in the socio-cultural characteristics of the individual and immediate household group members as well as other kinbased separate familial units within the lineage (bari) group. However, this does not fall within the purview of this study.

As suggested by this reviewer the relationship of every household member with the target child, in the context of child feeding and food intake by mother as well as the feeding pattern of the child and the eating pattern of the mother within the context of homestead will be examined during the participant observation. The social context and verbal interactions will be noted at the time of recording feeding as per suggestion of this reviewer which might be helpful in identifying the reasons for feeding and eating the vegetables by the target child or the mothers. All the above points are incorporated in the methods and procedures (p7).

The issue of "dissemination" of the knowledge to other households raised by the reviewer where no education was given though seems interesting but can not be addressed by the proposed study as there was no baseline information available from the original study for comparison. However, we shall ask a random sample of 50 mothers who received education whether they held any discussion with mothers of other households in the bari regarding feeding of vegetables to young child. This might provide some indication about dissemination.

Regarding the suggestion to repeat the 8-hour participant observation for 3 consecutive days which according to the reviewer might offset the effect of the presence of the observer. We think that by repeating the participant observation the effect of presence of the observer might rather be compounded.

### **Reviewer No.2:**

No substantive issue raised by this reviewer.

Finally we thank both the reviewers for reviewing this protocol.

