PN-AAG-010

FINAL REPORT

WORKSHOPS AND TECHNIQUES OF ENVIRONMENTAL INVESTIGATION

A REPORT OF WORKSHOPS HELD ON:

FEBRUARY 20-MARCH 3, 1978
MAY 22-JUNE 6, 1978

Submitted to US-AID
by the Program for International Development
Clark University
in conjunction with Contract # RFTP/OTR-50106

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FINAL REPORT

Workshop in Techniques of
Environmental Investigation

(Held February 20 - March 3, 1978)

(May 22 - June 6, 1978)

Program for
International Development

Clark University
Worcester, Ma. 01610

FINAL REPORT

Workshop in Techniques of Environmental Investigation

A Report of Workshop held
February 20 - March 3, 1978

Submitted to US-AID
by the Program for International Development
Clark University, in conjunction with
Contract No. RFTP/otr-50106

Leonard Berry
Professor of Geography
Co-Director, International
Development Program

Richard B. Ford
Associate Professor of History
Co-Director, International
Development Program

Clark University
Worcester, Massachusetts 01610

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FOREWORD

This "final" report is submitted as a preliminary indication of the results of two training workshops designed to increase the skills of mission project officers to prepare an Initial Environmental Examination (IEE). The report contains examples of the several products and schedules of the workshops. However, this document is very much a first draft report because:

1. A second evaluation (conducted three months after the completion of the first workshop) has recently been distributed to first workshop participants and results are still not fully compiled. This second evaluation forms an important part of the final report for the workshop as a whole.

2. The second evaluation (three months later) for the second workshop will not be sent out for another two months thus those data are not yet available.

3. A third workshop will be conducted from 24 July to 4 August. The recommendations of all three workshops will then be combined and analyzed as will be the evaluations of them. The recommendations will form a comprehensive body of suggestions for revisions to guidelines and possibly to procedures for assessing environmental impact of development projects. These recommendations will then become a formal body of information to be communicated in a final report to appropriate bodies.

Thus, the current document prepared about half way through the life of this contract, should be looked upon as an indicator rather than as a final statement of the project and materials completed.

June 23, 1978

CLARK UNIVERSITY

SECTION I. INTRODUCTION

The Program for International Development at Clark University sponsored a seminar (from 20 February to 3 March 1978) to assist in preparation of initial environmental examinations and environmentally sound development projects. The seminar had two objectives:

1. Environmental Assessment. To increase the capability of mission environmental officers to evaluate projects in the "initial environmental examination" stage of project design and to improve the effectiveness of environmental assessment of project impact;
2. Project Design. Through use of case studies and other task oriented techniques, to expose officers to a broad range of environmental/project relationships in a way that will enable them to gain experience in the design of environmentally sound projects.

Two sets of materials were used: (1) overview materials for environmental situations in each of the four regional bureaus; (2) representative case studies for three of the four regions. The overview materials and case studies were presented in the framework of small working groups and were used as "grist" for practicing procedures for conducting initial environmental examinations.

In addition to the two major sets of materials (above), we also provided participants with a guide to resources and information systems to assess environmental impact as well as a sample of books, pamphlets, and articles related to environmental assessment.

By the end of the two week seminar the objective was that participants should be able to:

1. identify potential detrimental environmental impacts;
2. prepare an initial environmental examination;
3. incorporate environmental considerations into project planning;
4. think about ways in which local institutions and local specialists can lend assistance in assessing environmental interactions.

SECTION 2. The Schedule - A Summary of Events

A copy of the two week schedule appears as Appendix E to Section 3.

A Sunday Evening session of February 19th successfully brought out the diversity of opinions on environmental issues. This was reinforced by two presentations-by Len Berry and Bert Printz - who set the scene for an extremely useful two-week exchange of news.

It was evident after the second presentation (Printz) that the majority of participants were concerned about the procedures for preparation of initial Environmental Examination (IEE's).

Animated discussion took place which continued into Tuesday morning. The discussion here formed the basis for small group work late in the second week.

Because time was short the small groups were not able to spend as much time as had been intended on the IEE for the Asian Reforestation Case Study. This meant that the first concentrated attempt to produce an IEE in small groups came on Thursday (23rd). However, here again time proved to be short so that most groups were unable to complete their assignments. All completed the IEE forms and the accompanying reports give a cross-section of the ideas broached. These reports appear as Section 4 of this report.

On Friday (24) the Latin American Case Study was discussed. The small group sessions were again rather short and concrete reports were not produced by most groups, but the work was not lost since it formed the basis for one group's work on the revision of guidelines for IEE's.

Work in the second week concentrated on revising the guidelines for IEE's of road, resettlement and health projects (examples being taken from the case studies of the first week), and on IEE procedures per se. The participants of this workshop thought that the small group work had been the most useful part of the course. The reports which were produced from these sessions are enclosed as Section 5 of this report.

The final two days were spent in plenary sessions discussing IEE procedures. These exchanges were put together with the small group work on procedures to make recommendations for revised guide-

lines for preparing IEE's (see Section 6).

The majority of participants seemed very satisfied with the two weeks work. The field trips were all thought to be successful, since different participants could see relevance to their own work in different trips. The outside speakers were appreciated, but particularly those presenting technical issues i.e. Schwarz, Townshend, and Okun. A full evaluation took place in session and this is presented here as Section C. A second evaluation was sent out to the participants, six weeks after the workshop. Due to the vagaries of postal systems throughout the world we are still receiving their replies. The second evaluation will thus be presented at a later date as an appendix to this report.

SECTION 3

INTERIM REPORT

AND

EVALUATION

Workshop on Techniques

of Environmental

Assessment

19 February - 3 March 1978

Conducted by the Program for International Development

Clark University
Worcester, Massachusetts

Leonard Berry and Richard Ford
Co-Directors

April, 1978

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FOREWORD

This evaluation of the Clark University Training Seminar represents a first cut at determining the most effective way to assist AID Mission Project Officers to assess the environmental impact of development activities. A two-week schedule of case studies, environmental overviews, reading materials on environmental impact, guest lecturers, field trips, small group working sessions, skill training sessions, and general discussions (see course schedule in Appendix E) comprised Clark's first offering of the course in February, 1978. Dr. Liberty Mhlanga of the Environmental Training Program, Dakar, Senegal, served as both a member of staff and outside evaluator. He drew up the questionnaire (see Appendix D) and compiled the responses of the Seminar participants. This report is based on his oral presentation to the Seminar toward the end of the scheduled time.

The report contains a summary and analysis of the participant's short run evaluations. This report later will be supplemented:

1. A short statement by Dr. Mhlanga which speaks to the appropriateness of the Seminar from the perspective of individuals, institutions, and government planning considerations in developing nations. (Appendix F)

2. A mail evaluation, elicited from Seminar participants between 4 and 8 weeks after completion of the Workshop. (App. G)

The details of the participant responses follow. It is clear that people had a constructive and positive experience in the Seminar. With one exception, all said they felt more confident about dealing with environmental issues in project planning and evaluation as a result of the Seminar. Readings, case studies, field trips, skill sessions, and small group work were received warmly, even enthusiastically. All left the Workshop with conviction that environmental issues were of concern, that effective steps could be taken to ease environmental pressures, and that a network of workshop participants could serve as one means to carry forward with this work. Participants also felt that attention to revising procedures for conducting initial environmental examinations (IEE) could result in more effective project planning and implementation.

The evaluation also produced a number of specific recommendations to improve the Workshop itself. The report and appendices describe these suggestions. Briefly summarized, the evaluations noted that: better and more extensive use could have been made of the case study materials; visiting lecturers could have focused more sharply on the precise and practical needs of Workshop participants; more attention should have been devoted

to training in specific skills of environmental assessment and management; more attention could have been provided to explain the four regional environmental profiles which participants received; and that more time was required to understand how to prepare scopes of work for environmental assessments (EA) and how the information from an EA could be integrated into continuing activities of development projects.

As a result of both the Workshop and this evaluation, a number of recommendations are being put forward. These recommendations, directed at several different audiences and levels, include:

1. A series of specific revisions which are being incorporated into the second session of the workshop, to be offered in May, 1978;

2. Thoughts on revised procedures and information for conducting an IEE;

3. Commentary on ways that IEE's an EA's can pave the way for more effective, sustained attention to and monitoring of the environmental dimensions of development activities;

4. Expanded mixes of personnel to bring to subsequent training sessions, including representatives of environmental groups, private voluntary organizations working in development activities, host country counter-part personnel and AID employees who are host country nationals;

5. Expanded emphasis on the technical dimensions of environmental assessment, particularly as these technical needs demand greater expertise in fields such as health, pesticide use, reforestation, road construction, rural infrastructure projects, water quality, resettlement, soil salinization, small scall irrigation, fertilizer usage, fishing enterprises, erosion problems, vector control, and techniques of biological control of weeds and pests.

Clark will follow-up on these several recommendations as well as take initiatives to keep a network alive which can exchange information, materials, experience, and procedures from the several participants.

I. EVALUATION OF WORKSHOP

A. Objectives

As stated, the aims of the Workshop were:

1. a) Increase the capability of mission environmental officers to evaluate projects in the IEE stage of project design,

   b) to improve the effectiveness of environmental assessment of project impact.

2. Use case studies and other task oriented techniques to expose officers to a broad range of environmental/ project relationships to enable them to gain experience in the design of environmentally sound projects.

Participants were asked during the second week of the Seminar to evaluate the Workshop's activities by: (a) completing the enclosed questionnaire (Appendix D); and (b) rating the materials used in the Workshop. All participants completed the questionnaire and a summary of these responses follows. So far, we have received only four ratings of the course materials. A summary of these ratings appear as Appendix C.

B. Technical Arrangements

As can be seen in Appendix A, with few exceptions, participants were satisfied with the technical arrangements. Specific suggestions were made to help correct minor problems for future sessions.

Although most found the timing of the Workshop satisfactory, particularly those who thrive on this year's brand of New England weather, some would have preferred a later date for

warmer temperatures and the opportunity to bring families along to see some of the historic and cultural dimensions of New England. Although most found the choices of either hotels or efficiency apartments quite satisfactory, one participant noted that the ten minute drive from the University to the hotel area and lack of restaurant in the efficiency apartment unit placed extra heavy demands on the transport. However, transport was generally thought to be quite satisfactory and all people thought that Clark itself was a good location for the Seminar. Local materials and resources describing the region again were found adequate.

Concerning technical details of the Seminar's reading materials, it was suggested that actual course documents be dated and labeled in ways that fit into a scheduled, daily reading assignment. Although verbal assignments were made each day, it was urged that these expectations be specified, in writing, at the beginning of the Workshop so that all would be able to pace their reading and written work throughout the two weeks.

Concerning orientation materials, it was suggested that more lead time be provided so that those, especially coming from Missions, could have ample time to select appropriate Project Identification Documents, Project Papers, Initial Environmental Examinations, and background data. Moreover, better lead time would provide participants with opportunities to bring copies of various regulations and manuals which were felt to be in need of revision.

Concerning staff personnel, most participants felt that the Clark staff could have presented the Workshop adequately without involving the four or five outside speakers. Most participants thought that the majority of lectures, although interesting, were not directly geared to the task at hand, that is preparation of Initial Environmental Examinations. Instead, several participants preferred either to hear the Clark staff speak in greater detail about their own environmental concerns in research or, alternatively, to bring outside speakers who had themselves prepared Initial Environmental Examinations or who represented environmental organizations such as the Environmental Protection Agency, the Natural Resources Defense Council, the Sierra Club, Friends of the Earth, the Conservation Foundation, etc. Several also suggested that representatives of these environmental organizations should also come as full time participants.

C. The Approach

Appendix B shows that the group found the Clark approach to the Workshop satisfactory. The case studies were thought to be useful although time did not allow proper development of the several points which could have been raised with the case studies. Evaluations suggest that it would have been better to take fewer case studies, perhaps only two, and develop them over a longer period of time with more specific tasks discussed and practiced. Many participants thought that specific PID's and PP's should have been included in the case study as well as at least one log frame.

Selected overview materials were found useful but most participants agreed that two weeks was too short a time to read them thoroughly. On the other hand, one participant felt the work load was not as taxing as it might have been. Participants did indicate, however, that they would use these materials when they returned to their home assignments and could see many valid uses for them in the future, along with the package of books handed out.

The field trips were evaluated as one of the most successful parts of the Workshop. However, one participant felt that they were too short to make any major impact on the whole course. The comment added that the person who wrote the IEE for the Dickey Lincoln Project (Corps of Engineers field trip) would have made a useful Workshop participant. Suggestions also came for future field trips including visits to sewerage plants, power companies, etc. who were themselves experiencing environmental conflict.

The small group sessions, particularly those with three or four people each, were rated very highly and much appreciated. The small group sessions engendered a lot of valuable interaction between Mission officers, Washington personnel, and Workshop staff. The potential strength of this network of communication should both be utilized and supported. Moreover, the diversity brought by two participants from private voluntary organizations was greatly appreciated and several comments suggested such diversity should be increased. One range of suggestions urged that representatives of groups such as the

Council for Environmental Quality or that national counterparts with whom AID Mission officers work could be invited.

Another comment related to the approach suggested that inclusion of films which would present alternative viewpoints as well as technical information would have helped a great deal. Agencies such as the Department of Defense, National Aeronautics and Space Administration, or the Smithsonian Institution might be approached to see what offerings they have.

Several comments suggested that the group itself was about optimal size with a good mix of Washington personnel and field officers. One participant, however, expressed hope that all four AID regional bureaus might be represented in future courses.

Another range of suggestions related to a library of source materials for Mission environmental officers which could be provided for each home mission. For example, the Clark Resource Guide listed a large number of items and included sample copies of these, but only half a dozen titles were available in multiple copies.

D. Attitudes to the Presentations

The majority of Mission officers found the introductory lectures by Printz, Berry, and Schwarz and the small group work to be the most useful parts of the Workshop. On the other hand, the Washington staff found the technical presentations and detailed information sessions and discussions as well as pro-

cedures and contents of IEE's to be more useful.

As noted already, with the exception of presentations by Bista, Okun, and Townshend, most participants found the visiting lecturers not as well utilized as might have been.

Individual recommendations were made on materials and presentations which could be included in future Workshops. These recommendations included:

1. More discussion of the scope of work for environmental assessments, team composition to produce environmental assessments, and AID environmental procedures from the PID stage all the way through to completion of environmental assessments and environmental monitoring.
2. More emphasis on techniques such as water sampling for pesticide run-off, snail counts, etc. and also more technical information such as presentations on specific issues of health or diseases as they relate to environmental characteristics.
3. More emphasis on agricultural type schemes because so much of AID's work is involved in agriculture.
4. More emphasis on physical and biological aspects of the environment such as irrigation, salinization, use of fertilizer.
5. More consideration of international environmental law as it relates to the specific work of the agency.

II. OVERALL SUMMARY OF ATTITUDES TO THE SEMINAR

The majority of participants now feel more comfortable in dealing with environmental issues. Some Mission officers thought that the Workshop had reinforced their previous conceptions but that they had been given more things to consider. Washington participants seem to feel more satisfied that a nucleus of AID staff were now better informed on environmental issues and more able to deal with the bureaucratic procedures set in place. Unhappily, some felt that our deliberations would have little impact on the reaction of CEQ, the Sierra Club, or other environmental groups which are urging that greater attention be given to AID projects.

Summing up, there was general agreement that the title of the Workshop should be changed. There was, in fact, more emphasis on procedures in the Workshop than on techniques. Although emphasis on procedures was not necessarily a bad thing, greater inclusion of specific techniques would have been more helpful. It was thought that the only real omission from the Workshop had been in summation to help in the collection of data for surveys for IEE preparation as well as presentations of alternative strategies to ameliorate adverse environmental effects.

In conclusion, all participants were pleased with the way the Workshop had been organized and implemented. Liberty Mhlanga said that this was "one of the first seminars where he had seen almost 100 percent continuous participation."

APPENDIX F

Evaluation of the February/March Workshop

Dr. Liberty Mhlanga

Environmental Training Program

Dakar, Senegal

As an individual from a developing country, I feel that the "spirit" in which the IEE's and EA's are made is good. These procedures probably follow logically from a greater awareness of environmental problems occasioned by the United Nations Stockholm Conference on the Environment of 1972. However, let me note that projects funded by AID and other donor agencies affect a relatively small number of people and occupy small physical areas in developing countries. Compare this with large areas occupied by the masses in developing countries which they use with varying degrees of guidance, environmental conservation and destruction. In other words, I feel there is a need for the concept of environmental assessment to be spread more widely and I doubt if the impetus for this can come from "the top" and be effective or have a significant impact.

Clark University has a project in East and Southern Africa, which aims to identify the major environmental problems of seven countries. Contacts are being made with groups in these countries, which are working on environmental concerns. Data are being gathered to build up a picture of environmental situations - in some cases students are being trained to collect the information. There are elements of this project which could be brought together with the AID Training Program to begin in a small but significant way to disseminate information and involve a larger number of people in the training process, who could then benefit themselves and their countries. For example, Emilias Kalapula of the University of Zambia and Adolpho Mascarenhas of the Bureau of Resource Assessment and Land Use Planning (BRALUP) at the University of Dar es Salaam are both involved in training students to do fieldwork in varied communities and are closely connected with government departments in their countries. There is tremendous potential here for disseminating ideas about environmental assessment.

You may feel that these comments are irrelevant to the March Workshop at Clark University but I do not think so. Some of us, who work in research institutes in developing countries, feel strongly that donor agencies should be aware of the realities of our problems <u>as perceived by those who are affected</u>. The March AID Workshop was approached from the standpoint of an "outsider" looking at projects in a developing country with the eyes, perceptions, assumptions, tools, etc. of an "outsider." This is not bad in itself and one cannot help it to a certain extent. However,

it seems to me that we could have more relevantly worked out our ideas on IEE's, EA's, etc. by looking at projects and training programs being carried out by people like Kalapula and Mascarenhas. We could then have made significant input into their institutions.

Let me also remark here that having ENDA represented at the Clark Workshop is "preaching to the converted." It would be valuable also to have representatives from organizations such as I.D.E.P. They have a fairly large following in developing countries, where they train economists, deal with social and class conflicts in the world of political economy, but they do not see environmental problems as being serious or deserving of attention. In fact many institutes in developing countries, at this time, would lack support for serious environmental assessment of projects. I have talked with a limited number of government planners in developing countries and formed the opinion that they would verbally support efforts on environmental assessment. However, when it comes to spending money on environmental safeguards, a much smaller number would be willing to support efforts. In spite of statistical findings to the contrary, many government planning personnel to whom I have spoken feel that including environmental safeguards in a project increases expenditure with little justification in the long run. This is one of the main reasons why I justify the Clark Workshop and support the participation of nationals, who are preferably counterparts of AID personnel in their countries.

APPENDIX A SUMMARY OF VIEWS ON TECHNICAL ARRANGEMENTS

Views asked re: -	Satisfactory M	Satisfactory W	Unsatisfactory M	Unsatisfactory W	Comments (M = Mission Officer W = Washington)
1. Transport Arrangements.					Days Lodge had no restaurant, so availability of vehicles was important for evening meals. A more deliberate arrangement for access to vehicles in the evening would be appropriate (W). Information should be available re a) getting from Boston (Logan) to Worcester (M) and b) addresses of good restaurants in Worcester (W). Need map of Worcester (W). Welcome packet with local information very useful (W).
a) Being met at airports	6	6	1		
b) Travel to and from hotels	7	6			
2. Mailing Conference Materials	5	2	3	3	Received 2 days before departed from Mission (M). Not received (3W). Package should have details of information delegates need to bring PID's PP's etc. (M).
3. Choice of Materials Used	8	5			Material should be dated and numbered (W). Suggest better editing (W). Need scheduled daily reading list (W). Critical AID documents e.g. PD63 and Regulation 16 should be highlighted (W). Much of material presented was academically interesting and stimulating but did not help in IEE techniques (M).
4. Choice of Lecturers	4	6	4		Some lecturers irrelevant (3M). Some lecturers underutilized (M). Too great a stress on geographers viewpoints (2M). Could be improved by bringing in outside lecturers from EPA. Other people who have done IEE's; lawyers (2M & W). Choose lecturers who focus entirely on environmental affairs (M). Clark staff should present their environmental work (M). Helpful to have lecturers go into depth about own research as relates to environment (Mhlanga). Resource people did not interact enough. Need more time to ask questions of lecturers (W).
5. Choice of Clark Location	8	4			Local resources sufficient to present and highlight materials (M). Cold room! (M). Would have been better to have lodgings close to Clark.
6. Choice of Time of Year	7	3	2		April/May better (M). If you like the weather! (W). Spring-Fall preferable (M). Good to have course in summer so participants could have option of bringing families (W).

NOTE: Totals for each section may not be the same since some participants did not respond to some questions.

APPENDIX B SUMMARY OF VIEWS ON THE APPROACH TO THE WORKSHOP

Views asked re: -	Satisfactory M	Satisfactory W	Unsatisfactory M	Unsatisfactory W	Comments (M = Mission Officer W = Washington)
1. Use of Case Studies	8	3	1	1	Too many case studies for two weeks. Better to do one thoroughly (M & W). Should be more specific in instructions much of time misdirected (M). Case studies required big element of Project Design (M). Belize case study not developed by all group - could be (W). Need PID's PP's as well (W & M). Not sure group taxed enough (W).
2. Use of Overviews	8	4	1	1	Rarely used, therefore cannot evaluate (M). Interesting and should provide stimulus to mission staff (M). Too much to read in two weeks (M).
3. Field Trips	8	6			Good but too short to make an impact (Mhlanga). Visit to small industry useful (W). Suggest more like L.D.E. i.e. sewerage plant or power company or others with environmental conflict (W). Person who did I.E.E. for Dickery Lincoln project would have been a useful lecturer or participant (M).
4. Small Groups	9	6			Small groups of 3 very effective (M). Small group discussion good (Mhlanga). Class size about optimal. Larger group work not as effective as groups of 3 (M).
5. Bringing Field and Washington people together	9	6			Good (M). Good and bringing in non-AID people (M). Good opportunities for communication AID/W and field officers - need continuing network communication (W). Need careful balance Washington/Mission. Suggest from Washington one person from each Bureau and G.C. and P.P.C and DSB (W). Could help and bring in national experts C.E.Q., E.P.A., Sierra Club etc (M). Should urge more PVO participation (M). External expertise essential (W).
6. Suggestions for Improvements	Workshop reading matter could be more concise and cover broader issues (M). Course needs more structure (W). Use more environmental films (M). Use training films for technical subjects from places like DOD/NASA/Smithsonian/CDE etc. (W).				

NOTE: All participants did not respond to all questions.

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APPENDIX C RATING OF CONFERENCE MATERIALS BY DELEGATES

Titles	Of great use	Useful	Of little or no use
Basic Materials - National Environmental Policy Act Regulation 16 etc.	xx		
More Water for Arid Lands	xxx	x	
The Picture of Health, Eckholm	xxx		
Large Dams and the Environment	xx	x	
Water, Engineers and Development in the Tropics	x	xx	
Energy for Rural Development	xxx	x	
Case Study - Feeder Roads	xx	x	x
Case Study - Onchocerciasis in West Africa	x	xx	
Case Study - Philippines Reforestation	x	xxx	
Overview - Latin America	x	xx	
Overview - Africa	xxxx		
Overview - Southeast Asia	x		xx
Overview - North Africa	x		
Resource Guide	xxx	x	
Remote Sensing	xxx		x

N.B. Only 4 ratings have been received from participants. This table is a summary of their views. In the written text, more general impressions are reviewed.

APPENDIX D

EVALUATION

SEMINAR OBJECTIVES:-

1. a) Increase the capability of mission environmental officers to evaluate projects in the I.E.E. stage of project design,
   b) to improve the effectiveness of environmental assessment of project impact
2. Use case studies and other task oriented techniques to expose officers to a broad range of environmental/project relationships to enable them to gain experience in the design of environmentally sound projects.

	Satisfactory	Unsatisfactory	Comments
A. Technical Arrangements:			
1. Transportation a) Meeting places b) Going to and from hotels			
2. Mailing of conference materials			
3. Choice of materials used			
4. Choice of lecturers			
5. Choice of Clark location for the seminar			
6. Choice of time of year			

7. Suggestions of how the above could have been improved:-

_____

_____

_____

_____

	Satisf.	Unsatisf.	Comments
B. Approach:			
1. Use of Case Studies.			
2. Use of Overview materials.			
3. Field trips.			
4. Small group discussion.			
5. Bringing field and Washington people together.			

B. Approach (Continued)

6. Suggestions _____

_____

_____

_____

C. Content.

1. Content of material supplied:

a) Which materials were most useful? Top Five.

1. _____
2. _____
3. _____
4. _____
5. _____

b) Which materials were least useful? Bottom Five.

1. _____
2. _____
3. _____
4. _____
5. _____

2. Content of presentations:

a) What topics/presentations were most use for participants own work?

_____

b) What topics/presentations were least use for participants own work?

_____

c) What important areas/topics were not included in the content which seem useful in the field _____

_____

3. What parts of the I.E.E. a) need changing? _____

_____

b) need to be retained? _____

_____

_____

_____

4. Is the idea of an I.E.E. a valid way of project environmental assessment? (comments please)

5. Are you more comfortable in dealing with environmental issues as a result of the seminar?

6. Suggestions/comments on the content in general.

SUMMATION OF THE SEMINAR IN GENERAL.

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
February, 20	February, 21	February, 22	February, 23	February, 24
Guest - Albert Printz 9:00 WELCOME AND KEYNOTE PLENARY - - - - - - - - - - - - 10:00 ENVIRONMENTAL ISSUES IN DEVELOPMENT (A presentation by L. Berry and discussion of principal issues in environment and development) PLENARY 12:15	Guest - Dr. Bahadur Bista Resource - Cynthia Enloe 9:00 Review Monday presentations 9:20 Environmental Impact and Analysis H. Schwarz PLENARY - - - - - - - - - - - - 10:45 Asian Case Study 11:15 Small groups to perform IEE on Asian Case Study SMALL GROUPS	Resource - Doug Johnson 9:00 Review Asia Case Study, homework 9:20 Bioclimatic Maps: Overview tools for assisting in IEE - D. Johnson PLENARY - - - - - - - - - - - - 10:45 Small groups using bioclimatic maps as tools for assisting in IEE SMALL GROUPS	Guest - Mike Horowitz Resource - Earl Scott and Eileen Berry Charles Hays 9:00 Review field trip, Mid-East overview 9:20 M. Horowitz PLENARY - - - - - - - - - - - - 10:45 Africa Case Study Plenary Presentation Then into small groups E. Scott/E. Berry Charles Hays SMALL GROUPS	Guest - Mike Horowitz Resource - Larry Lewis and John Townshend 9:00 Review Africa 9:20 Use of Remote Sensing in Environmental Examination J. Townshend PLENARY - - - - - - - - - - - - 10:45 Latin American Case Study Plenary Presentation Then into small groups SMALL GROUPS
	L	U N C	H	
1:15 Course Overview, including administrative details R. Ford PLENARY - - - - - - - - - - - - 2:45 PROCEDURES IN ENVIRONMENTAL PROTECTION: An Introduction to Initial Environmental Examination Bert Printz PLENARY Assignment Asian Overview and Case Study	1:15 Asian Case Study, small groups (con't) SMALL GROUPS - - - - - - - - - - - - 2:45 Report back to large group on IEE of 4 small groups, Asia PLENARY Assignment Bioclimatic Maps	FIELD TRIP - I CORPS OF ENGINEERS, WALTHAM Environmental examination and water resources - possibly using monitoring techniques such as remote sensing Assignment Africa Case Study and Overview Evening -- Boston - Optional	1:15 Small groups, (con't) African Case Study SMALL GROUPS - - - - - - - - - - - - 2:45 Report back to large group on IEE of 4 small groups, Africa PLENARY Assignment Latin American Case Study and Overview	1:15 Small groups, (con't) Latin American Case Study SMALL GROUPS - - - - - - - - - - - - 2:45 Report back to large group on IEE of 4 small groups, Latin America (prepared 29 December 1977)

SCHEDULE FOR ENVIRONMENTAL TRAINING SEMINAR

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
February, 27	February, 28	March, 1	March, 2	March, 3
9:00 Review work of first week 9:30 Directions and agenda revision for week II PLENARY - - - - - - - - - - - 10:45 Individual projects brought from home missions SMALL GROUPS	9:00 Individual projects, brought from home missions SMALL GROUPS - - - - - - - - - - - 10:45 Report back on small group work on individual projects PLENARY	Guest - Dan Okun 9:00 Small groups to prepare IEE on data accumulated on field trip to local light industry SMALL GROUPS - - - - - - - - - - - 11:30 Report back - small groups PLENARY	9:00 Recommendations for reworking: a - IEE procedures b - EA c - ELS PLENARY AND SMALL GROUPS	Resource - Saul Cohen 9:00 Technical Issues in Environmental Protection: A Review PLENARY - - - - - - - - - - - 10:45 Development in the Global Context Saul Cohen PLENARY
	L	U N C	H	
1:15 Small groups, (continued) SMALL GROUPS - - - - - - - - - - - 2:45 Report back on small group work on individual projects PLENARY	FIELD TRIP - II Local light Industry to assess how environmental impacts are done domestically	1:15 Plenary - group reports (continued) 2:15 Environmental Engineering: The Experience of Alexandria's sewage system D. Okun	FIELD TRIP - III Old Sturbridge Village: To assess environmental impact of agricultural village circa 1810 DINNER - Public House Sturbridge, MA.	12:30 Concluding Luncheon Banquet REVIEW AND EVALUATION L. Mhlanga 2:15 ADJOURN (prepared 29 December 1977)

SECTION 4. WEST AFRICAN CASE STUDY - SMALL GROUP ACTIVITY

1. Instructions to the Groups.

Today's case study describes a 20 year multidonor, multinational program of eradication of a fly which transmits a parasite which causes blindness and other health impediments over a large area in West Africa.

In Upper Volta, the program has high government priority and US-AID and other donors have helped to prepare plans for the development of cleared areas. Specific projects for planned village development are proposed.

In the meantime, the planned settlement is being complicated by spontaneous movement into areas already cleared or about to be cleared.

Instructions

Through work in small groups: -

1. Complete an I.E.E. form for an AID project for planned village settlement.

2. Suggest in a note how you would treat the unplanned settlement.

3. Write a supporting statement to accompany your I.E.E. to Washington.

In this statement spell out: -

a. Why you might need an E.A.

b. Areas of inadequacy of replies on the form.

c. Possible host country and local attitudes to the environmental issues raised.

2. Results of Group Work

Because of time constraints the groups were unable to complete all the assignments on this case study. However, they chose to follow separate routes and therefore the following reports (in total) cover the assignment set.

IMPACT IDENTIFICATION AND EVALUATION FORM

GROUP A.

Impact Areas and Sub-areas 1/	Impact Identification and Evaluation 2/
A. LAND USE	
1. Changing the character of the land through:	
a. Increasing the population	H
b. Extracting natural resources	H
c. Land clearing	H
d. Changing soil character	
2. Altering natural defenses	L
3. Foreclosing important uses	L
4. Jeopardizing man or his works	L
5. Other factors	
Need to know soil characteristics and	
other resources of areas moving into	
to identify appropriate use.	
B. WATER QUALITY	
1. Physical state of water	M
2. Chemical and biological states	M
3. Ecological balance	H
4. Other factors	
Water supply for human consumption (groundwater resources)	

1/ See Explanatory Notes for this form.

2/ Use the following symbols:
N - No environmental impact
L - Little environmental impact
M - Moderate environmental impact
H - High environmental impact
U - Unknown environmental impact

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C. ATMOSPHERIC

1. Air additives ---------- _____

2. Air pollution ---------- _____

3. Noise pollution ---------- _____

4. Other factors

_____ _____

_____ _____

D. NATURAL RESOURCES

1. Diversion, altered use of water Effect of run-off - added siltation of rivers and Lake Volta Effect on fish and acquatic life _____

2. Irreversible, inefficient commitments Diversion of river water for irrigation - effect downstream _____

3. Other factors

Wildlife species should be looked into. _____

_____ _____

E. CULTURAL

1. Altering physical symbols ---------- _____

2. Dilution of cultural traditions ---------- H

3. Other factors

_____ _____

_____ _____

F. SOCIOECONOMIC

1. Changes in economic/employment patterns ---------- H

2. Changes in population ---------- H

3. Changes in cultural patterns ---------- H

4. Other factors

_____ _____

_____ _____

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G. HEALTH

1. Changing a natural environment _____ _____

2. Eliminating an ecosystem element _____ _____

3. Other factors Village source of water and waste disposal systems (effects of ground water from waste ~~disposal). Effects of pesticides. Irrigation~~ possible introduction of schisto. or new parasites.

H. GENERAL

1. International impacts Ghana _____ _____

2. Controversial impacts ~~Why African Governments~~ not supportive. _____

3. Larger program impacts _____ _____

4. Other factors

_____ _____

_____ _____

I. OTHER POSSIBLE IMPACTS (not listed above)

_____ _____

_____ _____

_____ _____

See attached Discussion of Impacts.

Memo to AID/W

A major involvement in the Upper Volta resettlement scheme would require an environmental assessment. Potential adverse political repercussions from the project would at best be controversial. They could include reactions stemming from environmental failure of the oncho control scheme - a fundamental pre-condition to this project. There is a possibility that schizto and/or trypanosomiasis could increase among the resettled populations as consequences of change to vegetation and water patterns.

The apparent political realities of GOUV support for the project suggests that resettlement would primarily involve peoples without traditional knowledge of the microclimatic agricultural opportunities. Since technological changes contemplated are not likely to be fully adapted to the environment and/or crop choices. Potential failure or conflict in the new settlement may be high.

Specifically, the following matters lead up to the recommendation: (keyed to I.E.E. form)

A. Most of the land use will probably have a high environmental impact because land is the major base for development in the region proposed. However, extracting natural resources poses problems as to the type of extraction envisaged.

B. Water quality could be a direct problem, especially if the water in question is from areas in which oncho blackflies breed. A settlement in this area will be an interesting entity given the awareness by the GOUV and AID about Oncho.

C. Direct atmospheric impact considered slight.

D. Considerations of impact on natural resources unknown with data presented.

E/F. Implied immigrations and known ethnic differences suggest high cultural changes.

G. The very reason for the settlement implies a new healthy environment.

H. Controversial impact was considered to be high on the supposition given the known views of the parties involved - i.e. Government and its ethnic composition.

I. Political realities, food production and public health implications should be considered a possible crucial element in project design.

Team: Fields/Dangler/Liberty

Planned resettlement, as currently envisioned and attempted by G.O.U.V. and the A.A.V.V. is capable of producing both political conflict and environmental dysfunctions. Either might eventually be linked to the intervention.

We believe that AID should conform to its mandate by providing only indirect support to voluntary and accomplished resettlement.

Project design must incorporate indirect incentive strategies for provision of techniques and imputs proven on the basis of prior or test experiences.

The major goal of the project must offer benefits defined as enhanced life security achieved through participatory design (by the settlers) of:

1. Tenuvial relation to basic resources (land & water)
2. Continuity/medical services and technology
3. Continuity of food supplies through direct production and marketing arrangements
4. Soil, water, and wildlife protection technologies

GROUP B.

1) Goal To improve the health and well-being of the people in the project area in order to alleviate economic constraints and social pressures.

2) Objectives

   1) Disease and vector control
   2) Effective land use
   3) Increase food production capacity
   4) Controlled migration and resettlement into the project area

3) Encourage the creation of an organization within the responsible agency of the government to establish a negotiation and educution process including trade-offs and compensation for unplanned settlements and to also establish edicts and methods of enforcement.

IMPACT IDENTIFICATION AND EVALUATION FORM

Impact Areas and Sub-areas 1/	Impact Identification and Evaluation 2/
A. LAND USE	
1. Changing the character of the land through:	
a. Increasing the population	H
b. Extracting natural resources	N
c. Land clearing	H
d. Changing soil character	M
2. Altering natural defenses	H
3. Foreclosing important uses	H
4. Jeopardizing man or his works	N
5. Other factors	
_____	_____
_____	_____
B. WATER QUALITY	
1. Physical state of water	H
2. Chemical and biological states	H
3. Ecological balance	H
4. Other factors	
_____	_____
_____	_____

1/ See Explanatory Notes for this form.

2/ Use the following symbols:
N - No environmental impact
L - Little environmental impact
M - Moderate environmental impact
H - High environmental impact
U - Unknown environmental impact

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C. ATMOSPHERIC

1. Air additives ---------- N
2. Air pollution ---------- N
3. Noise pollution ---------- N
4. Other factors

_____ _____

_____ _____

D. NATURAL RESOURCES

1. Diversion, altered use of water ---------- H
2. Irreversible, inefficient commitments ---------- U
3. Other factors

_____ _____

_____ _____

E. CULTURAL

1. Altering physical symbols ---------- H
2. Dilution of cultural traditions ---------- H
3. Other factors

_____ _____

_____ _____

F. SOCIOECONOMIC

1. Changes in economic/employment patterns ---------- H
2. Changes in population ---------- H
3. Changes in cultural patterns ---------- H
4. Other factors

_____ _____

_____ _____

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G. HEALTH

1. Changing a natural environment ———— H ____
2. Eliminating an ecosystem element ———— H ____
3. Other factors

____ ____

____ ____

H. GENERAL

1. International impacts ———— H ____
2. Controversial impacts ———— H ____
3. Larger program impacts ———— H ____
4. Other factors

____ ____

____ ____

I. OTHER POSSIBLE IMPACTS (not listed above)

____ ____

____ ____

____ ____

See attached Discussion of Impacts.

Notes to accompany the I.E.E. form

A. Land Use - Taking fertile unused land for development as farm land. Project must therefore include infrastructure so methods are not deleterious to ecology.

B. Water Control - See above re. farming and water constant monitoring of water re. insecticide necessary.

C. Atmospheric - No impact

D. Natural Resources - See A. Above

E. Cultural - Change in traditional ways should be introduced gradually and carefully. Subdivisions should be along ethnic lines.

F. Socio-economic - Should have farmers pay a nominal sum for their land so that they can own it or they must move out.

G. Health - Continuous monitoring of health program. Health program itself should address problems of farming community.

H. General - (1) International regional planning for overall development of the area, (2) Effect of program downstream, (3) Spin-off effects e.g. manpower shifts regionally; marketing, commerce, increase in social services.

4. a) While it is considered that in environmental assessment will be required for AID involvement in this project the I.E.E. indicates a potential favorable balance on the environmental quality and the socio-economic development. Nevertheless, alternations in the environment are such that: (1) uncontrolled migration, (2) failure to provide effective land use patterns, or (3) lack of attention to other disease constraints on development (i.e. shisto., tryp., sanitary facilities and others) could lead to over exploitation or disaster in respect to the stated objectives.

In respect to migration the three important modes of colonization (listed p. 26) are particularly important in respect to an assessment. These apparent existing colonizations pose important problems in terms of land tenure or traditional land rights which may require negotiations, disciplinarian actions or some form of tradeoffs.

Land use patterns should be based on integrated agricultural programs involving food crop, cash crops and livestock.

Specific consideration must be directed to other diseases that may be as important as oncherciasis in terms of development constraints.

It would be advisable to consider an integrated health and vector control program where both the infra-

structure and personnel particularly technician level are used in cross disciplinary programs. While it is long range and will require extensive training, a periodicity in field activity should permit the use of personnel trained in any one of the major disease areas in others. This is particularly important in the effective use of equipment, supplies and vehicles or aircraft.

In terms of research development a serious effort should be made to encourage biological target specific systems that will reduce or eliminate the use of hazardous pesticides. There are a whole series of actions that will reduce the volume of pesticide apolication such as microencapsulation, ultra low volume apraying and the development of improved application of non-toxic pesticides.

b) Complete revision of the I.E.E. form is suggested.

c) Any consideration of environmental assessment must take into consideration the host country attitudes. In some cases host countries may elect to carry out control systems, etc. that may not necessarily be generally acceptable environmental standards. If the development process is to be effectively achieved there should be a way to reconcile the extreme diversity in opinions.

IMPACT IDENTIFICATION AND EVALUATION FORM

GROUP C.

Impact Areas and Sub-areas 1/	Impact Identification and Evaluation 2/
A. LAND USE	
1. Changing the character of the land through:	
a. Increasing the population	H
b. Extracting natural resources	L
c. Land clearing	H
d. Changing soil character	M
2. Altering natural defenses	M
3. Foreclosing important uses	N
4. Affecting man or his works	H
5. Other factors	
Tenure	H
B. WATER QUALITY	
1. Physical state of water	M
2. Chemical and biological states	M-H
3. Ecological balance	H
4. Other factors	
Quantity (source of water)	
Groundwater levels	

1/ See Explanatory Notes for this form.

2/ Use the following symbols:
N - No environmental impact
L - Little environmental impact
M - Moderate environmental impact
H - High environmental impact
U - Unknown environmental impact

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C. ATMOSPHERIC

1. Air additives ---------- H
2. Air pollution ---------- _____
3. Noise pollution ---------- N
4. Other factors

_____ _____

_____ _____

D. NATURAL RESOURCES

1. Diversion, altered use of water ---------- L
2. Irreversible, inefficient commitments ---------- L
3. Other factors

_____ _____

_____ _____

E. CULTURAL

1. Altering physical symbols ---------- N
2. Dilution of cultural traditions ---------- H
3. Other factors

_____ _____

_____ _____

F. SOCIOECONOMIC

1. Changes in economic/employment patterns ---------- H
2. Changes in population ---------- H
3. Changes in cultural patterns ---------- H
4. Other factors

_____ _____

_____ _____

G. HEALTH

1. Changing a natural environment ———— H
2. Eliminating an ecosystem element ———— H
3. Other factors

———— ————

———— ————

H. GENERAL

1. International impacts ~~Regional project~~ ————
2. Controversial impacts ———— ~~H~~
3. Larger program impacts ———— N
4. Other factors

———— ————

———— ————

I. OTHER POSSIBLE IMPACTS (not listed above)

———— ————

———— ————

———— ————

See attached Discussion of Impacts.

Notes to accompany the I.E.E. form

A. Land Use

Intent of the project is to increase population density with all that implies in alteration of the environment. External resources to be little affected though careful consideration should be given to what trees, shrubs and plants species to be left and what to be removed. In clearing land, need to consider potential erosion in flood plains and elsewhere when natural vegetation replaced by fields. Implication of special management requirements of heavy soils need to be fully understood and transferred to new settlers. Annual stream flows and extent of flooding needs to be carefully assessed to avoid settlements in annual flood areas.

B. Water Quality

The major effects on water are foreseen as emanating from: (1) initially the application of pesticides used in reducing vector population, (2) runoff into streams from other agricultural pesticides as well as fertilizer, and (3) contamination or increased turbidity as a result of increased and more intensive human activity. Here there are two areas where we believe further investigation is needed: An analysis of the chemicals and other compositions to be applied to the area, and the study or analysis of the vector and/or other organisms which may be affected by pesticide application, regarding their ecological role in the food chain. We also need more knowledge of groundwater and aquifer areas which may be reached by these additives, or impacted upon by human activity.

Resettlement could also make the population prone to diseases existing in the new environment.

We assume that the types of agricultural practices to be used would not place any new stress on flood potential - however, this would have to be confirmed.

C. Atmospheric

Check areas to be affected by spraying larvicides and insecticides.

D. Natural Resources

Modification may occur if irrigation is attempted.

E. Cultural

These effects are of considerable concern as government policy is to mix ethnic groups and spontaneous migration is in process. Altered farm management/cultural practices will have a variety of effects on village life e.g. women's roles, children's roles, animal husbandry being adopted.

F. Socio-Economic

There will be changes here, although most could conceivably be the reversal of a pattern of changes which originally resulted from outmigration. This is an area in which the project hopes to have its successes manifested. At this point we would want to do some cross-analysis with social and economic analyses, to make sure that these goals are compatible with environmental consequences. As an example, until control of disease is confirmed, any comparatively heavily non-transferable capital investment should be discouraged. Some analysis is also needed

of the implications of integrating both disparated ethnic groups as well as planned settlers and squatters.

G. Health

Effect of eradication of blackfly on other animal/insect relations. (Tsetse and mosquito particularly and shistosomiasis if irrigation used). Assume village water supply will be better protected - less disease transmission. Animal health - small ruminants do have special health problems.

IMPACT IDENTIFICATION AND EVALUATION FORM

GROUP D.

Impact Areas and Sub-areas 1/	Impact Identification and Evaluation 2/
A. LAND USE	
1. Changing the character of the land through:	
a. Increasing the population	H
b. Extracting natural resources	N
c. Land clearing	M
d. Changing soil character	L
2. Altering natural defenses	N
3. Foreclosing important uses	N
4. Jeopardizing man or his works	N
5. Other factors	
_____	_____
_____	_____
B. WATER QUALITY	
1. Physical state of water	L
2. Chemical and biological states	L
3. Ecological balance	L
4. Other factors	
_____	_____
_____	_____

1/ See Explanatory Notes for this form.

2/ Use the following symbols:
N - No environmental impact
L - Little environmental impact
M - Moderate environmental impact
H - High environmental impact
U - Unknown environmental impact

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C. ATMOSPHERIC

1. Air additives ---------- N
2. Air pollution ---------- N
3. Noise pollution ---------- N
4. Other factors

D. NATURAL RESOURCES

1. Diversion, altered use of water ---------- L
2. Irreversible, inefficient commitments ---------- N
3. Other factors

Possible irrigation

E. CULTURAL

1. Altering physical symbols ---------- N
2. Dilution of cultural traditions ---------- H
3. Other factors

F. SOCIOECONOMIC

1. Changes in economic/employment patterns ---------- H
2. Changes in population ---------- H
3. Changes in cultural patterns ---------- H
4. Other factors

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G. HEALTH

1. Changing a natural environment ———— H
2. Eliminating an ecosystem element ———— M
3. Other factors

———— ————

———— ————

H. GENERAL

1. International impacts ———— N
2. Controversial impacts ———— H-M
3. Larger program impacts ———— H
4. Other factors

———— ————

———— ————

I. OTHER POSSIBLE IMPACTS (not listed above)

Relationships to other diseases and vectors, transportation, communication, marketing conditions. ———— H H

See attached Discussion of Impacts.

Notes to accompany the I.E.E. form

AID Project needs an E.A. - it should address the total rural development project.

A. Water resources - groundwater or water supply for human consumption. Impact on rivers through irrigation, increased use of pesticides and fertilizers, from soil erosion through clearing. Effects on biota-fish. Effect of siltation on Lake Volta.

B. Soil Studies - Soil studies needed to identify proper land use within the area.

D. Disease and Vector Introduction - Possibility of animals, irrigation and new people moving in introducing disease.

D. Social-cultural - trying to introduce people of different backgrounds poses problems.

E. Endangered Species - need to look at wildlife and plant species because disruption of ecosystems.

F. Socio-Economic - changes in types of farming due to soil differences. Introduction of new tree species. What types of animal should be introduced? Study needed of water management for human and animal consumption and irrigation.

G. Health - Changes in traditional diets due to new food crops? Domestic water supply and waste disposal system. Effects on groundwater of waste disposal pesticides, etc.

Note on Unplanned Development

The unplanned spontaneous settlements may have high environmental impact. This impact may result from improper land use (i.e. high population densities on certain areas) or inefficient site selection (the planned siting method is probably more efficient in terms of community services such as water, schools, clinic, etc.). However, these physical environmental effects must be considered in light of social realities and the unpleasant situations that can arise when relocating populations.

Our group concluded that overall, the better choice is to allow the spontaneous settlers to stay on the land they have chosen and that the Project should include a component which would monitor this development, collecting data on "what works" within the new settlements. It was also pointed out that the Project should include a strong body for arbitrating and settling disputes among the settlers and that this body could be used as a means of encouraging settlers to adapt some aspects of the planned community. That is, the body could use the project supplied benefits (water supply, schools, clinics) as incentives, so that when the unplanned communities have met some criterion of a planned community (i.e. separation of cropland and residences) they could be considered legitimized and provided with the project supplied benefits.

SECTION 5 Reports of Revised Guidelines

Small Group Instructions

I. Theme-based groups

For the three theme-based groups (roads, health), you are asked to:

A. draw upon available documentation and personal experience to prepare a set of guidelines which will be useful in preparing an IEE for a project in your selected theme, i.e. roads, etc. Do not feel constricted in the format or approach, but try to limit your guideline to four pages or less so that it will be used. For a sure audience, think in terms of mission environmental officers who are charged with preparing IEE's.

The guideline should identify potential problem areas which should receive special attention as well as suggest critical indicators to look for in order to anticipate environmental impacts. Include a brief list of sources.

B. prepare a model IEE on the same theme as above, using the existing checklist but altering it as appropriate. Think of the IEE as worthy of distribution to all missions as an example of what one could look like.

C. Assume that a positive determination has been made on your above project theme. Prepare a scope of work which identifies the areas in need of particular attention in the EA and indicate the composition of the team you would call for to perform the EA.

II. Guideline groups

A. Rework the existing content and format of the present IEE guidelines in a form which you find more suitable to meet the need.

B. Prepare a set of procedures which will establish a pattern for IEE's to move through the existing project planning and approval stages, taking into account more specific environmental needs and suggesting ways in which the IEE/EA/EIS or other environmental efforts can be more effective in influencing the project planning process.

Reports of the Small Group Work

REPORT OF THE HEALTH GROUP

The group first considered the most important impacts of development projects on health. Six major areas were identified: nutrition, water resources, population changes, social and cultural changes, technology, human animal associations.

As a result of our discussions we enclose the following:

I. Six questions to be included in the I.E.E. questionnaire. They relate to the six areas identified above.

II. Background statements providing information on types of impact in 5 of the six areas (social/cultural impacts omitted here (ed.)).

III. An examination of some questions related to resettlement and road projects (NB. no questions received re: technology or population and road projects (ed.)).

IV. Scope of work and composition of team.

I. HEALTH QUESTIONS FOR I.E.E.

1. Indicate possible consequences to the nutritional status arising from this project.

2. What might be the effect of changes in water resources for the health of the population?

3. If there are changes in the density, composition and movement of the population as a result of project activities, what will be the consequences for health?

4. Examine this project for social and cultural changes which may have an effect on the health status of the population.

5. If this project introduces mechanical, chemical or other technology what are the consequences for health and accident occurences?

6. The effect of human-animal association on diseases, vectors and parisites.

II. BACKGROUND STATEMENTS FOR IMPACTS ON HEALTH

A. Nutrition

Nutrition and its relationship to the health status of a population is an important factor in development. In order for people to live at opyimum energy and productivity levels, health levels must be maximized. Development projects may be designed to: (1) increase the quantity, and/or quality of food and/or water available, or (2) impact indirectly or potentially on available food and/or water resources.

Projects involving changing land and/or water use patterns may result in local supplies being improved or degraded. Depending upon the nature of these changes dietary improvement or deficiency could follow. For example, on one hand, improved small-scale farming practices could result in greater availability of food, or, on the other hand, market cash crop innovations could reduce this availability if food resulting in greater nutritional deficiency.

The vulnerability of maternal, infant, and early childhood populations deserves special attention. The greater populations at risk, these three sectors, must be a focus of attention. Direct and indirect nutritional risks and benefits of development projects must be examined, for as nutrition improves or deteriorates, susceptability to disease is raised or lowered.

Finally, the availability of energy fuels may have a bearing on nutrition. Changes in the availability of fuel for cooking and heating may adversely or positively effect food preparation as well as thermo stress.

B. Water Resources Related

Water resources, their management and their development have a major impact on the health of people. Some potential impacts are as follows:

1. Vector habitats can change which may produce changes in the incidence of diseases eg. malaria, onchocerciasis, filariasis, yellow fever, dengue and trypanosomaiasis.

2. There are a number of diseases which are directly water-borne eg. typhoid fever, hepatitis, gastro-intestinal disease, amebiasis and schistosomaiasis.

3. Water-related diseases are those which usually relate to inadequate water for personal hypiene eg. trachoma, scabies and skin infections.

4. Water quality and quantity: pollutants (chemical, salinity and sediments) and actual volume of water per capita for cooking and cleaning should be considered.

5. Will the development activities affect water-dependent food supplies such as fish, water plants, etc.

C. Population

The increase or decrease of population in a given area may have an impact on the environmental health situation. The factors to be considered in assessing this impact include the following:

1. Resources: Have adequate resources been made available by responsible authorities for:

   a. Housing-location, spacing, dealing with either existant or possible crowded conditions, etc;

   b. Sanitary facilities - Do they exist at all; are they adequate or inadequate - if inadequate, what remedial plans are being considered;

   c. Allocation of health resources, i.e. funds, equipment, personnel (health manpower) etc.

2. Planning: Will proposed health interventions affect in any way:

   a. Any proposed or planned health survey work;

   b. Environmental sanitation;

   c. Vector control i.e. sanitation, safe water.

   What plans now exist or are in the process of formulation to prepare adequate means of dealing with these matters?

D. Alterations in Technology

Most projects involve changes in technology in an area with resultant health consequences including:

1. Mechanical; vehicles, earth moving equipment, mechinery etc. leading to new accident potential and new access to health facilities.

2. Chemical; pesticides, herbicides and chemical pollution. These may have negative and positive impacts. Direct in the form of removal of disease carrying insects and thus improving local health, direct in the form of negative impacts on people and animals, indirect in

the impact of chemicals on animals in the food chain and on water systems.

3. Health technology vaccines, drugs medicines, X-ray equipment generally positive impacts with some potential for indirect negatives.

4. There is a critical need to review the consequences of conventional systems of pest control. Many are actually or potentially contributary to degredation of the environment. There are a number of new approaches designed to alleviate or eliminate deleterious systems.

   A. Biological control systems which are target specific and emerging:

      1) Sterile Male Technique
      2) Biological predators
      3) Natural or genetic resistance
      4) Insect Growth Regulations
      5) Pheramones
      6) Juvenile Harmones
      7) Repellents.

   B. Extended protection by safe or biodegradable agents:

      1) Microencapsulations of pynetheum
      2) Slow release systems for Chemotherapeutic material or vaccines.

   C. Improved Insect Trapping:

      1) Light attractants
      2) Electric traps
      3) Animal traps.

E. Human/Animal Relationships

Developmental projects of almost any character or size will impact to some degree on man/animal relationship. These impacts include physical, environmental changes, health/disease changes, and modified nutritional standards. Changes may be expected or unexpected, beneficial or detrimental and they may be managed.

Changes in the physical environment are related to utilization of food and forage. Certainly development projects that brings population concentration as ones that stimulates population dispersal will affect land utilization in terms of producing food crops for human consumption and/or forage for animals. In this context consideration must be given to livestock or animal stocking rates in relation to available forage,

crop by-products and water. Among the most serious detrimental attempted development projects have been water exploitation which concentrates human/animal populations in areas where feed, forage, or crop production is limited.

Animal production may involve the use of herbicides or pesticides to control insects or diseases which, if uncontrolled, may lead to deterioration of the environment. Human/animal relationship inevitably cause health problems since animals harbor disease agents communicable to man and some are vectored by insects common to both species.

Many animals including wildlife are reservoirs of infections.

Development projects may produce environmental changes conducive to introduction and/or expansion of insect disease vectors or pests.

Generally, development projects that incorporate or lead to livestock increases or improvement result in improved nutritional status through production of high quality protein, yet the reverse situation may occur if animals impinge on the utilization of land for essential crop production. Plans should incorporate and infrastructure and organization to provide adequate health care for human and animals involved. The system must deal with all phases of health care ranging from quarantine, through preventive medicine to treatment.

In addition to these problems of infectious and communicable diseases etc. construction inevetibly leads to first line accidents to human and animals and similar mechanisms such as infrastructure, organization, and treatment capability must be provided.

III. QUESTIONS AND COMMENTS RELATED TO RESETTLEMENT AND ROAD PROJECTS

A. Nutrition Parameters of Resettlement Projects

1. Is there any consideration given to nutritional needs (often health) in project planning?

2. What is nutritional status of people moving into resettlement area?

3. Are cropping plans related to nutritional needs of population?

4. Will there be any exchanges and/or potential conflict between planned and unplanned settlement food sources or supplies? (any nutritional relationship?)

B. Nutritional Parameters of Road Building Projects

1. Is there any consideration given to nutritional (other health) needs in project planning?

2. What is nutritional status of various populations?

3. How will diets change over time with road building project? nutritional requirements of roadbuilders?

C. Water Resources and Resettlements Projects

1. Vector habitats could change due to increased agricultured activity. This would especially be true if the resettlement area developed irrigation in a major way. Clearing of land adjacent to rivers could reduce trypanosourorasis.

2. Influx of people into a resettlement area could increase the possibility of water-borne disease due to contamination of existing water supply. Individuals with disease could introduce disease into the resettlement area.

3. Water/capita must be increased or maintain to preclude development of diseases related to decreased personal hygiene.

4. No known chemical or other pollutants, agricultural activity could introduce pollutants into existing water resources. Adequate water supply for cooling and cleaning must be planned.

5. Aquatic life could be affected by water contamination due to increased population.

D. Water Resources and Road Projects

1. There is the potential for rector habitat changes during the road grading and construction process. This could produce or increase disease burden in the population. Adequate drainage must be provided for in the road construction.

2. Influx of construction workers could introduce new diseases and contamination of existing water resources could occur.

3. Construction workers would increase utilization of fresh water in project area which could prove problematic for people dependent upon existing supplies.

4. Road construction and any subsequent soil erosion has potential for contaminating available supply of water and reducing water supply if the long run of erosion occurs.

5. Food supplies could be affected in sitting occurs in rivers, streams or ponds in the area.

E. Population and Health Planning - Resettlement Projects

The resettlement of the population has been occasioned initially by the presence of a debiliating disease in a particular area. Under any resettlement pattern health planning and the development of rural delivery systems becomes very important. This aspect of health delivery systems should be manifest through the development of MCH and association health manpower development programs. The host government will need to develop health plans, especially disease profiles for dealing with the resettlement. Resources must be assured for implementation. Resources must be assured for implementation. Adequate personnel must be available for the day-to-day operation of the plans and the plans developed must be related to the overall development plans for the resettled area.

In resettling housing-particularly plans for spacing and types of structures-must be analyzed. Sanitary facilities in the resettled area must be of sufficient size to accommodate the size of the anticipated population. Total environmental sanitation needs to be assured throughout the area. If these problems are not analyzed prior to the resettlement of the population the high rates of infant morbidity and mortality may duplicate those prevailing in other parts of the country.

Adequate food supplies must be made available. Resettled people can be expected to undergo changes in nutritional habits and requirements. An analysis will need to be made to assure that food supplied are adequate and that the food will be accepted by the resettled population. Otherwise, the resettled family's resources may be divided with a resultant deterioration in nutritional standards.

Finally, the health plans for resettlement must be interrelated to other development plans in the area. Analysis should be made of these interrelationships. In particular the linkages between health plans and such areas as agriculture transportation, education, communication and other development efforts should be thoroughly analyzed by health planners not only working for the host government but with externals donors as well.

F. Population and Health Planning Reforestation/Resettlement

(The following additional points about resettlement projects are gleared from the discussion on the Philippines case study).

In any reforestation effort which in essence designed to prevent desertion man and environment and closely inter-related. With reforestation man who has long had dominion over the earth and its resources may be called upon to move to a totally different environment. A thorough review of health planning particularly with regard to disease profiles needs to be undertaken and/or updated.

If disease will be encountered in the new locale which were not present in the old the reforestation efforts may be frustrated. One the affected peoples are persuaded that there is a vital need to carry on the reforestation efforts appropriate housing must be found with due regard to sanitation (ie.e. waste disposal).

In order to accomplish this task there must be perhaps a different ordering of health resources. The failure to perform this task may only serve to accentuate alteady troublesome disease problems.

In addition to the allotment of funds. There will of necessity have to be the reordering and structuring of the health services. The particular host government agency charged with carrying out this task and assuring the delivery of health services to areas immediately adjacent to the reforested areas will have to plan for personnel equipment and appropriate structures to accomplish this task. In addition, there will be an urgent need to assure the provision of cheap protection in foods in order that the nutritional needs of the affected population can be properly addressed.

G. Technology - Resettlement Projects

1. How can use of undesirable pesticides be eliminated or reduced?

2. What new technologies can replace conventional pest and insect control?

3. What levels of technological training are necessary to explain new control systems?

H. Human/Animal Relationship-Resettlement Projects

The same or similar situations occur in resettlement - but their trend is generally in the direction of drawing humans/animals from diverse sources. Here, the tendency is to concentrate exposure to a wide variety of disease vector, parasite factors. Providing the precautionary measures are equally important to those enumerated in the road development situations.

However, in resettlement in intensive planning and development of sanitary facilities - water sewerage etc. - is essential.

In the organized movement of Human/animals consideration must be observed for the possible susceptibility of these populations to new or previously not experienced diseases, vectors and parasitisms. It should be noted that strain difference in diseases may be important, that resident vectors may be exposed to newly introduced diseases via new population of humans or animals or that silent on accult diseases in indigenous population may find an active mechanism for producing infections or even epidemics in the new susceptible populations.

I. Human/Animal Relationships - Road Projects

Road and other transportation development inevitable lead to human/animal migration in some degree. In many instances movements may involve dispersal of human and animals from original focal points to a whole series of new locations. But the feasibility of access may also result in movements from extensive rural agricultural areas to heavily populated urban areas. Movement in either direction at particular points leads to a concentration of humans/animals and an attendant personal contract that will facilitate the spread of diseases vectors and parasitism unless precaution in the way of immunizations and treatments or in the provision of sanitary measures and facilities are provided. In some cases the results may be explosive or disasterous. In all instances new focal points or new reservoirs for diseases, vectors and parasites will be established.

IV. SCOPE OF WORK AND COMPOSITION OF TEAM

The Scope of Work would be in large part dependent upon several other variables including: (a) Major areas of potential environmental problems as indicated on IEE, (b) Background and skills of other members of EA team, (c) Types of expert consultative input available within the host country. The medical member of the environmental assessment team should be trained in public health and have had experience or training in environmental health with a strong emphasis on infectious disease control. The individual should have also had field experience (more than short-term) in a developing country. This consultant would need approximately four weeks in the country and might need an additional 1-2 weeks to talk to experts in other countries who have good understanding of the lost country situation.

The consultant would want to talk with the following people during the consultation period:

1. Ministry of Health - Would gather information regarding prevalent diseases in project area as well as discuss what health services are available and planned for the influx of population. Would also arrange field trip to project area to talk with health sector people there to get their assessment of the situation. While on field, they would assess the area for potential problems i.e. look for vector habitats etc. Consultant would also discuss nutritional status and nutritional habits of population in general and get information regarding how increased numbers of people will be fed.

   Information regarding general sanitation and waste disposal and potential problems related to increased population will be assessed (through data and on field trip).

2. Ministry of Water Resources and Irrigation - Consultant will discuss availability and quantity of water in project area and what provision has been made for adequate supply of water for drinking, cooking, cleaning and for livestock. Assessment of potential for pollution of potable water by project activities will be made. If irrigation is part of project activity, information will be collected on likelihood of increased disease problems (schistosomiasis and walowa) as a result of project activities.

3. Ministry of Housing - Information regarding availability and quality of housing for increased population in project area will be collected. If anthropologist is available in Housing Ministry - assessment of subcultural impacts of project will be made.

4. Ministry of Agriculture - Discussion here will focus on projected land use of resettlement area looking at how this land use may affect nutritional status of population.

   Information in types of livestock which are indigenous to the project area and whether there are plans for increases in livestock density planned. Simultaneous with this investigation, data will be collected regarding prevalent livestock disease and the likelihood of increased problems in relation to spread of disease to humans will be assessed.

This Scope of Work is applied to a resettlement project but some parts of it could also apply to road building project.* The most important dimension of this whole consultation would be a field trip to the project area itself to gather site information and perceive potential problems on a first hand basis.

The consultants future should be allotted as follows:

a. 10 days in capital city gathering information at ministries etc.

b. 7-10 days-field trip to project area and discussion with people there.

c. 7-10 days - back in capital city to have further discussion and information gathering based on field trip report-meeting.

All of the above Scope of Work would be considerably modified, based on composition of EA team and available expertise in the host country.

*In a road-building project, however, the problems related to the construction project itself would be investigated further, e.g. accidents related to the construction itself and the road after construction, environmental alterations due to the road building such as stream pollution and creation of new vector habitats.

REPORT OF
THE GROUP ON ENVIRONMENTAL CONSEQUENCES
OF RESETTLEMENT SCHEMES

The group tried to think through the several ways in which previous resettlement schemes had created environmental changes and what might have been done in order to anticipate these.

We have produced three documents:

1. A matrix which classifies resettlement schemes and itemizes their environmental consequences, direct and indirect.

2. A set of guidelines indicating common direct effects of resettlement schemes, based on a modification of existing IEE form.

3. A set of guidelines indicating possible indirect effects of resettlement schemes. These are not adeuqately accommodated on the existing form and we suggest an additional section is needed.

N.B. In assessing indirect effects we tried to decide which variables were significant and these are set out as <u>information categories</u>, which could be added to the IEE form. <u>Critical indicators</u> are yardsticks for early assessment of risk areas of concern. The third category, <u>warning signs</u>, provides examples of the kind of signals that might alert a reviewer to potential problems.

4. Scope of work and composition of team

ST=Short Term
LT=Long Term

1. MATRIX. ENVIRONMENTAL CONSEQUENCES

		DIRECT								INDIRECT THROUGH:							
		Land		Water		Vegetation		Health		Land Use Changes		Technology Changes		Social Organization Changes		Changes in Distribution of Benefits	
	YPES	ST	LT	ST	LT	ST	LT	ST	LT	ST	LT	ST	LT	ST	LT	ST	LT
BY PLACE	Irrigated Area																
	Hillslopes																
	Desert																
	Drained Marshes																
ORGANIZATION	Government controlled																
	Gov. Assist.																
	Spontaneous Uncontrolled																
	Govt. Ignored																
ECONOMIC GOAL	Increased Cash Flow																
	Increased Food																
ECONOMIC GOAL	Settling Refugees																
	Military																
	Political Integration																
	New Social Organization																

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INITIAL ENVIRONMENTAL EXAMINATION FOR
RESETTLEMENT PROJECTS

To determine direct impacts of resettlement.
Impact Areas and Sub-areas - See Explanatory Notes for this form.

Impact Identification and Evaluation - Use the following symbols:

N - No environmental impact
L - Little environmental impact
M - Moderate environmental impact
H - High environmental impact
U - Unknown environmental impact

A. LAND USE

	N/L/M/H/U
1. Does the project change the character of the land through:	
a. Erosion	
b. Land Clearing	
c. Change in animal or plant habitats	
d. Modification of land use	
e. Increasing concentration/ population	
f. Waste Disposal	
g. Chemical change	
2. Potential natural disasters	
3. Unplanned agricultural activity (e.g. spontaneous settlement)	
4. Other factors	
B. WATER RELATED IMPACTS	
1. Does the project change the quality of water resources through:	
a. Drainage pattern	

	N	L	M	H	U
b. Modification of flood patterns					
c. Water table change					
d. Salinity modification					
e. Waterlogging					
f. Pollution of adjacent waters					
g. Induce sedimentation of adjacent waters					
h. Chemical change					
i. Waste disposal					
j. Ecological balance					
k. Other factors					
C. ATMOSPHERIC					
1. Does the project induce atmospheric changes through:					
a. Pollution (vehicle generated e.g. dust, exhaust)					
b. Air pollution (cargo generated e.g. chemical, asbestos, phosphates, etc.)					
c. Noise pollution					
d. Other factors					
D. NATURAL RESOURCES					
1. Does the project change the natural resource balance through:					
a. Planned and unplanned exploutation					

	N	L	M	H	U
b. Utilization of limited resources for construction _____					
c. Demands on local energy resources _____					
d. Other factors _____					
_____					
E. CULTURAL					
1. Does the project affect the culture through:					
a. Affect traditional cultural values _____					
b. Alter physical symbols _____					
c. Alter traditional modes of transportation _____					
d. Alter traditional living patterns through increased mobility changes in family structure _____					
e. Other factors _____					
_____					
F. SOCIOECONOMIC					
1. Does the project affect socioeconomic conditions through:					
a. Changes in ownership/land values/tenure _____					
b. Changes in market pattersn (local, natural, regional) _____					
c. Increase demand of services (e.g. public and private automative, water supplies, health, etc.) _____					
d. Change in transportation pattern (cost; cargo) _____					
e. Changes in economic/employment patterns _____					

	N	L	M	H	U
f. Changes in local institutions _____					
g. Changes in ethnic composition _____					
h. Changes in the distribution of costs and benefits _____					
i. Other factors _____ _____					
G. HEALTH					
1. Does the project affect health standards through:					
a. The creation of stagnant water which may result in increased disease vectors _____					
b. Increased carrier mobility (human and/or animal) _____					
c. Dietary changes (introduction of new food products) _____					
d. Increased traffic accidents (human and animal) _____					
e. Other factors _____ _____					
H. GENERAL					
1. Does the project have:					
a. International impacts _____					
b. Controversial impacts _____					
c. Larger program impacts _____					
d. Other factors _____ _____					

I. OTHER POSSIBLE IMPACTS (not listed above)

	N	L	M	H	U

GUIDELINES FOR PREPARING AN I.E.E. FOR PROJECTS DEALING WITH RESETTLEMENT - TO DETERMINE INDIRECT EFFECTS OF THE PROJECT

In assessing indirect effects we tried to determine what variables one would look for under broad category headings. For each category 1-10 read from left to right. We identify the information category and then suggest some critical indicators which could direct attention to potential impacts. Using the Upper Volta Case Study as an example, we then present warning signs to look for in some cases.

INFORMATION CATEGORIES	CRITICAL INDICATOR	WARNING SIGNS
1. Objectives of Scheme	What is agreement between donor DAP (or equivalent) host gov't five year plan; and some assessment of stated needs of local participants?	Potential conflict exists between previous residents in settlement area and the government goal to bring in new settlers of a different ethnic group.
2. Institutional Capacity to organize the move or implement change	Determine whether the budget, human resources, equipment, and infrastructure of the major institutions to be involved in fact have the experience and capacity to do what is intended.	In the case study, there is no evidence that AVV (the major institution involved) has the capacity to carry out the resettlement effort. This data should be provided before any environmental decision is made.
3. Can the proposed site support the goals of the project?	Determine whether there is an impact on 1) man/land ratios, 2) health, 3) water availability, 4) water quality, 5) ground cover.	Pilot studies should identify potential trouble spots.

4.	Does project recognize and take into account the local social realities?	a. ethnic compatibility: if more than one ethnic community is involved, is there evidence of traditions either of reciprocity or conflict? b. family roles: will project change family responsibilities or identities? e.g. will women produce less of food crop? will children spend more time in school? will fathers assume different role because of presence of cash crop? c. is any traditional official or function displaced? e.g. is chief's control over land or water rights reduced? is responsibility or income of someone such as the traditional well-tender undercut? d. land tenure: are traditional claims respected or is new legal/ownership mechanism implemented. If so, to what extent is it compatible with traditional ethnic practices? e. view of good life: does project reinforce or conflict with traditional view of the good life? e.g. do changes encroach on use of time or does it reduce number of choices about how time will be used? f. physical symbols of a culture; will project destroy or violate any sacred sites or import sumbols/shrines?

5. Economic reality a. debt/income	a. current levels of personal debt and income; propensity to incur debt; projected impact of new activities and ability to repay debt.	
b. marketing/ transport	b. existing system of marketing and transport sufficient to cope with proposed activities.	
c. employment	c. project planner's perspective of employment possibilities consistent with participant view?	
d. cash crops/food crops	d. if cash incomes derived from cash crops are involved, are they consistent with participant goals? Do they increase vulnerability? Do participants have choices in ratios between cash crop and food crops?	
6. Politics - leadership and decision making	Does project undercut traditional leadership or decision making roles?	
7. Mechanics of relocation:		
Stage 1 Mobilization	What plans exist to move population and what preliminary arrangements have been made?	Absence of plan in West Africa case study
Stage 2 Movement	Means and motivation defined or not.	Resistance.
Stage 3 Initial Requirements	Have provisions been made to supply food, start up amenities, until first harvest comes in.	What does plan say?

Stage 4 Long Range Requirements		What does plan say?
8. Participation of local people and communication.		
1. Policy and Planning Level	Awareness of local needs	
2. Field and action level	Do plans or feasibility study exist?	
3. Participant level	What methods have been used to gather participant perspectives? Are there local groups or councils? Has feedback been built into plan? What evidence is there of involvement by women and all participating ethnic communities.	
9. Comparison between old environment and new environment.		
Climate		Has consideration of such comparisons been incorporated into plan?
Soil structure		
Topography		
Health		
Vegetation		
Diet		
10. Provision for monitoring continuing environmental situation	What is stated as monitoring provision?	

SCOPE OF WORK

A. Description of the Project

B. Objectives and Goals

C. Brief description of the required studies vis a vis the project including the objectives and goals.

D. Looking at the people and their life style in their present locations:

Study the areas where people will be relocated and report on the environmental impact. Consider problems which will arise if any, especially in the areas of:

- the physical environment
- the human/social environment
- economic environment
- health environment

E. Stages of Work

The consultant team will submit a phased plan for carrying out this task, including the sequence for staffing.

Periodic progress reports

Final draft of report

Final report

Note: The final report will be submitted to the donor for comments/acceptance/distribution

F. Presentation of Final Report

I. The report should be presented in 3 parts:

1. Impacts on Natural Environment

2. Impacts on Human Systems

3. Alternates and Their Impacts

II. It should be time phased to consider the above, before and after the relocation of people.

Note: Normally the Scope states what is to be done in the report rather than by whom. Our list of "expertise" is academic.

III. Provide for short term consultants such as: Hydrologists-Climatologist - Behavioralist, etc.

G. Composition of Team

1. Ecologist

2. Social Anthropologist with experience in West Africa

3. Economist with experience in marketing

4. Agronomist

5. Soils Science

6. Agricultural engineer (irrigation)

7. Civil engineer (roads/wells cum ground water specialist)

8. Public Health

Note: Multi discipline team membership is encouraged as well as French language capability. Team leader should be proficient in French.

GUIDELINES FOR
PREPARATION OF INITIAL ENVIRONMENTAL EXAMINATION
REQUIRED FOR RURAL ROADS PROJECTS

(These guidelines are meant to assist environmental officers in the preparation of IEE for rural road projects. The guidelines are to be used in conjunction with the attached revised IEE checklist for rural road projects).

1. LAND RELATED IMPACTS*

a. Potential erosion problems in project area

A road project may be planned in an area with existing or potential future erosion. This will effect - in near or in distant future - the utilization/maintenance of the road, as well as affecting adjacent land and water.

b. Creating land erosion/land slide problems as a result of construction

Road construction connected with land grading and excavation can induce land slides and/or initial or additional land erosion. Poorly designed mountain roads' hydraulic structures can channel waters onto erosion-prone hillsides, etc.

c. Removal of plant/animal habitat

Road project related land grading usually removes the land cover and the topsoil could alter or even remove plant habitat. Changes in plant habitat can induce short-term and long-term changes in animal habitat in the project area. Traffic on the road could also alter animal habitat and movement.

d. Land use changes in project area

A rural road will change access to markets. Road traffic will create new commercial demands and opportunities. As a result, the previously subsistence agricultural use of land can change to commercial service oriented or industrial use. The subsistence farming could be converted to more intensive cash crop farming.

*Impacts are not listed in order of priority.

e. Potential natural disasters in project area

A rural road may be planned in natural disaster prone areas such as flood plain, near an active volcano, in an earthquake area, or in the path of frequent typhoons or hurricanes. Location of roads in such areas requires careful research.

f. Overgrazing

Rural road projects usually will increase the population (people and animals) along the road. Many farmers will use the roadside and adjacent ground cover for grazing purposes which could lead to overgrazing, resulting in problems of erosion, as well as posing traffic hazards.

g. Other factors (describe and evaluate)

2. WATER RELATED IMPACTS

a. Changes in drainage patterns

Rural roads, especially in mountainous areas, will affect the existing natural drainage patterns. Road sections in deep cut areas and poorly designed hydraulic structures can create erosion runoffs and possible flooding problems. Road construction related slope changes will alter the soil's water absorption capacity, etc.

b. Changing flood conditions

A mountain road could channel waters during a rainstorm into inhabited or agricultural lower land. A poorly designed roadfill in a plain can act as a dam and create flooding problems.

c. Changing ground water table

Deep excavation and larger hydraulic structures could affect the level of the ground water table. Road traffic-induced secondary services (e.g. new wells, new village water systems) could have similar affects.

d. Changing the salinity in the project area

Road construction related excurtions and well drilling could result in salt water infusion into agricultural land in the proximity of seashore areas.

e. Water pollution

A pollutant by definition causes deleterious changes in the state of water, usually of a chemical or biological nature. Near-shore or inland water-side construction sides could generate pollutant runoffs, affecting waters.

f. Sedimentation

Increased saltation or sediment loads change the physical state of water-borrow pits, newly excavated road "cut" sections, uncovered new slopes could be sources of water-borne sediments to nearby waters, thus affecting reservoirs downstream.

g. Changing the ecological balance

When pollutants lessen, the amount of light that penetrates the waterbody, photosynthesis is diminished or stopped, thereby altering the ecological balance of the waterbody and bringing about associated biological and chemical changes. Sedimentation can also affect the plant and aquatic animal environment.

h. Other factors (describe and evaluate)

3. ATMOSPHERIC IMPACTS

a. Airborne pollution (construction generated)

Road construction activities can create air pollution through removal of ground-cover and resulting dust can affect inhabitants of area.

b. Airborne pollution (traffic/cargo generated)

Increased moforized traffic will bring higher level of dust

and exhaust fumes which can affect inhabitants. In addition, cargo transport of chemicals, gases, minerals etc. can result in spills or leaks which can have deleterious effects.

c. Noise pollution

Movement of numerous vehicles of all sizes can cause noise pollution which can affect living conditions in habitations near road, disrupt agriculture (i.e. chicken and egg-raising), alter sleeping customs with effect on population growth.

d. Other factors (describe and evaluate)

4. NATURAL RESOURCES

a. Exploitation of natural resources (short-term)

Rural road projects can utilize in the construction stage natural resources (e.g. sand, gravel, rock, etc.), available only in limited quantities in the area, thus limiting other uses.

b. Exploitation of natural resources (long-term)

New or reconstructed roads can open unplanned access to natural resources. A plentiful natural resource might be taken without foreknowledge of the ecological role it plans (e.g. sand might be extracted offshore without the realization that this sand may replenish adjacent beach areas. The establishment of a road could result in an unplanned mining operation, deforestation, etc.

c. Other factors (describe and evaluate)

5. CULTURAL IMPACTS

a. Changing cultural values

A rural road project may introduce new elements affecting the traditional cultural values. Changes may be induced due to the greater mobility and accessibility of the population.

b. Altering physical symbols

A rural road project may, unless special precautions are taken, alter or destroy physical symbols of a culture, (e.g. monuments, sacred ground, ancient shrines, etc.)

c. Changing living patterns

A rural road project may affect the traditional cultural habits of the populace, in particular the traditional cultural transportation modes. For example, the road may have to be designed with an extra lane or wide shoulder for pedestrian, bicycle, pedical, or other transportation nodes.

d. Design compatibility with traditional behavior

Will the project, though providing greater accessibility and mobility, induce changes in the traditional living pattern and family structure?

e. Other factors (describe and evaluate)

6. SOCIO-ECONOMIC IMPACTS

a. Changing land ownership/values/tenure

A road into a previously inaccessible area could create new opportunities for production and influence the value of adjacent lands and existing tenure and ownership patterns.

b. Changing marketing patterns

A new road could lead to the introduction of new or increase the supply of existing commodities resulting in new marketing, storage, and commercial needs and opportunities.

c. Changing demand/availability of services

Project can increase access to health delivery services

on the one hand and facilitate access to existing educational facilities which were not previously utilized or underutilized due to distance on ruggedness of terrain. A new road could also facilitate access to water supplies, resulting in greater demand for such supplies.

d. Changing the mode of transportation

A new road would likely permit the introduction of new types of transportation, i.e. buses and taxis, thereby impacting upon the use of traditional transportation systems (animal etc.) with an attendant effect on relative price/cost structure.

e. Changing the economic/population growth patterns

Certain industries may decide to relocate because of the availability or easier access to sources of labor, or conversely allow greater labor mobility. Marginal land may be brought into agricultural production or used for industrial or commercial purposes resulting in increased employment, migration, and demand for support services.

f. Other factors (describe and analyze)

7. HEALTH IMPACTS

a. Stagnant water-related health hazards

Will the project increase stagnant water which will result in potential increased health hazards? Culverts along roads often increase standing water which serves as a breeding ground for disease-carrying vectors.

b. Change in communicable disease transmission

Will the increased mobility of humans and animals due to the project lead to the increased transmission of communicable diseases?

c. Changes in dietary habits

Will the project induce dietary changes, such as through the introduction of new food products which will affect the population in the project area?

d. Traffic accident caused health impacts

Will the project cause increases in human and/or animal traffic accidents?

e. Other factors (describe and analyze)

8. GENERAL IMPACTS

Some impacts are of overriding international interest and concern. Others, while not immediately apparent, may accrue to an overall program of which the proposed activity is a part, or an early step. Thus, general impacts may involve:

1. Activities that will affect the United States or other nations, directly or indirectly, now or at some later time. The agent for such impacts could be the ocean, the atmosphere, or carriers such as man, birds, or other organisms.

2. Activities that are matters of controversy locally, nationally, or globally.

3. Activities that are part of a larger program, or intended to be part of a larger program, whose total effect would require an appraisal of environmental impacts. If the activity fits this category, then use the present form for the appraisal of the entire and overall program.

4. Other factors. (Please describe and evaluate).

SCOPE OF WORK
FOR
ENVIRONMENTAL ASSESSMENT OF RURAL ROADS PROJECTS

A. Critical Areas of EA

1. Examination of physical environment i.e. soil and sub-soil structure, topography, erosion potential, hydrology, natural disaster history.

2. Engineering characteristics of project, i.e., horizontal and vertical alignment of proposed road, drainage, construction materials, design parameters, alternative route, ensure that design appropriate and compatible with traditional transportation modes.

3. Socio-cultural-economic environment, i.e., land use, tenure, and value; labor availability; production patterns; marketing, storage, and transportation network; possible impact of unplanned exploitation of natural resources in the project area (deforestative, overgrazing, etc.); alteration of traditional culture values.

4. Health and population environment, i.e., transmission of communicable diseases (human and animal) in project area, potential dietary changes, determine the need for expanded health delivery system, potential population increases and shifts in population.

B. Composition of EA Team

- Environmentalist or Ecologist (Team Leader)
- Rural sociologist
- Economist
- Public health officer
- Geologist
- Engineer

INITIAL ENVIRONMENTAL EXAMINATION FOR
RURAL ROAD PROJECTS

Impact Areas and Sub-areas - See Explanatory Notes for this form.

Impact Identification and Evaluation - Use the following symbols:

N - No environmental impact
L - Little environmental impact
M - Moderate environmental impact
H - High environmental impact
U - Unknown environmental impact

A. LAND USE

	N/L/M/H/U
1. Does the project change the character of the land through:	
a. Erosion	
b. Excavation and/or grading	
c. Change in animal or plant habitats	
d. Modification of land use	
e. Increasing concentration/ population	
2. Potential natural disasters	
3. Unplanned roadside activity (e.g. overgrazing)	
4. Other factors	

B. WATER RELATED IMPACTS

1. Does the project change the quality of water resources through:	
a. Drainage pattern	

	N	L	M	H	U
b. Modification of flood patterns					
c. Water table change					
d. Salinity modification					
e. Pollution of adjacent waters					
f. Induce sedimentation of adjacent waters					
g. Ecological balance					
h. Other factors					
C. ATMOSPHERIC					
1. Does the project induce atmospheric changes through:					
a. Pollution (during construction e.g. dust)					
b. Pollution (vehicle generated e.g. dust, exhaust)					
c. Air pollution (cargo generated e.g. chemical, asbestos, phosphates, etc.)					
d. Noise pollution					
e. Other factors					
D. NATURAL RESOURCES					
1. Does the project change the natural resource balance through:					
a. Planned and unplanned exploitation					

	N	L	M	H	U
b. Utilization of limited resources for construction _____					
c. Other factors _____ _____					
E. CULTURAL					
1. Does the project affect the culture through:					
a. Changes in traditional cultural values _____					
b. Alter physical symbols _____					
c. Alter traditional modes of transportation _____					
d. Alter traditional living patterns through increased mobility changes in family structure _____					
e. Other factors _____ _____					
F. SOCIOECONOMIC					
1. Does the project affect socioeconomic conditions through:					
a. Changes in ownership/ land values/tenure _____					
b. Changes in market patterns (local, natural, regional _____					
c. Increase demand of services (e.g. public and private automative, water supplies, health, etc.) _____					

	N	L	M	H	U
d. Change in transportation pattern (cost; cargo) _____					
e. Changes in economic/employment patterns _____					
f. Other factors _____ _____					
G. HEALTH					
1. Does the project affect health standards through:					
a. The creation of stagnant water which may result in increased disease vectors _____					
b. Increased carrier mobility (human and/or animal) _____					
c. Dietary changes (introduction of new food products) _____					
d. Increased traffic accidents (human and animal) _____					
e. Other factors _____ _____					
H. GENERAL					
1. Does the project have:					
a. International impacts _____					

b. Controversial impacts _____

c. Larger program impacts _____

d. Other factors _____

_____

	N	L	M	H	U

I. OTHER POSSIBLE IMPACTS (not listed above)

_____

_____

_____

See attached Discussion of Impacts

CLARK UNIVERSITY

SECTION 6. Workshops in Techniques of Environmental Investigation

The attached draft guideline for preparing initial environmental examinations (IEE) is a product of a two-week workshop held in February, 1978 at Clark University. The purpose of the Workshop was to train AID project officers in techniques of environmental examination and to review existing procedures for conducting initial examinations.

One recommendation of the Workshop was revisions to IEE guidelines, along the following lines. The draft is distributed here to a number of interested parties for reaction. We plan to incorporate a second draft of these guidelines into the May Workshop materials and to use the revised document in working through case studies during that training program. Thus, if you have any recommendations for changes in this version, we would appreciate receiving them by 25 April.

After the May Workshop, we assume there will be additional changes. A third draft will result from that Workshop and be submitted formerly to appropriate environmental officers in AID/Washington for their consideration to incorporate into new IEE guidelines.

(14 March, 1978)

Guideline

for

Preparation of Initial Environmental Examination

I. Introduction

As set forth in Policy Determination No. 63 and in AID Regulation 16, Environmental Procedures (as amended) AID is committed to careful consideration of the environmental implications of all AID-supported projects.

Procedures for environmental evaluation of AID projects have now been developed under the title Regulation 16, Environmental Procedures. They stem from the U.S. National Environmental Policy Act of 1969 (NEPA) and implementing regulations issued by the President's Council on Environmental Quality Guidelines. Although NEPA is primarily focused on domestic environmental problems, it has influenced an approach to the study of environmental problems that is applicable to non-U.S. situations. The purpose of the AID Environmental Procedures is to insure that the environmental impacts of AID activities are given appropriate consideration at the earliest possible stage of project design, taking into account particular countries' stages of development, goals, and priorities.

II. General Information

A. The first step in AID's Environmental Procedures is preparation of an Initial Environmental Examination (IEE) concurrently with Project Identification Documents (PID). The purpose of the IEE is to identify reasonably foreseeable direct and indirect environmental impacts, to

estimate their probable significance and to recommend a threshold decision as to whether further study - an Environmental Assessment (EA) or Environmental Impact Statement (EIS) may be required. A finding of significant potential environmental impact at the PID stage does not preclude a decision to move forward with an activity; it does mean, however, that the impacts must be considered during project design and prior to Project Paper (PP) final approval.

If some of the activities to be conducted under the project are not identified in sufficient detail to permit the completion of an Initial Environmental Examination at the PID stage, the PID will include (i) an explanation indicating why the Initial Environmental Examination cannot be completed; (ii) an estimate of the amount of time required to complete the initial environmental analysis; and (iii) a recommendation that a Threshold Decision be deferred until the Initial Environmental Examination is completed. The responsible Assistant Administrator will act on the request for deferral concurrently with action on the PID and will designate a time for completion of the Initial Environmental Examination. In all instances this completion date will be in sufficient time to allow for the completion of an Environmental Assessment or Environmental Impact Statement, if required, before a final decision is made to provide AID funding for the project.

B. It is essential that the IEE be made an integral part of early project design so that sufficient time is available for EA or EIS completion and so that findings can be factored into final project design.

C. The person (or persons) who prepare(s) the IEE needs to be familiar with the objectives and details of the project, particularly in the context of its relation to host country and people. He/she may wish to call upon the Mission environmental officer, or specialists (host country or other) for specific assistance or pertinent information.

D. The depth of analyses required in the IEE depends on the kind of project contemplated. Three general categories are identified as follows:

1. Projects which by their nature will ordinarily have little or no impact on the environment will not require preparation of an EA or EIS. Examples of such activities are:

a. Education or training programs not directly or significantly affecting the environment.

b. Controlled experimentation exclusively for the purpose of research which is confined to small areas and is carefully monitored.

c. Analyses, studies, academic or investigative research workshops and meetings.

d. Document and information transfers.

e. Contributions by the US to international, regional, or national organizations which are not for the purpose of carrying out a specifically identifiable project or projects; in respect to which the US reserves no right of review of activities financed with such contributions.

f. Institution building grants to American institutions such as provided for under Section 211(d) of the Foreign Assistance Act.

g. Program loans.

h. Loans or grants to intermediate credit institutions and/or regional development banks, including financial transfer type projects, where the third party action are unknown; non-specific or lack significance in terms of their environmental impact.

i. Loans or grants for core cupport to private voluntary organizations and international or interregional organizations.

j. Projects where AID is a minor donor.* (See footnote).

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* Minor Donor- AID is a minor donor for purposes of these Environmental Procedures when its total contribution to a multidonor project will not exceed $1,000,000 or 25% of the estimated project cost, provided, that AID does not, under the terms of the agreement governing its contribution, control the planning or design of the multi-donor project.

IEE's on the types of projects noted above will consist of a summary description identifying them as such, and will recommend a Negative Determination. Such recommendations will be approved by the Mission or Office Director.

2. Projects which by their nature could ordinarily be expected to have significant environmental dimensions and which should be very critically examined as to the need for an EA or EIS. Examples of these are:

   a. Chemical programs including those involving pesticides.
   b. Certain large-scale on the ground research activities such as pilot tests involving hazardous substances, large area land transformation, or extensive treatment of sizeable areas.
   c. Regional development programs that include comprehensive development plans and specific works projects.
   d. Irrigation schemes.
   e. Road building or rebuilding projects.
   f. Large public utilities and infrastructure such as dams, power plants, rural electrification, water supply, and sanitary sewer systems.
   g. Large-scale manufacturing or processing projects.
   h. Other large-scale land use activities.

3. All other projects.

III. Definitions

The definitions given here are excerpted from the AID Environmental Procedures and are also repeated, where useful, in the text.

A. Initial Environmental Examination (IEE)

An Initial Environmental Examination is an initial study of the reasonably foreseeable effects of a proposed action on the human environment. Its function is to provide the basis for a Threshold Decision as to whether an Environmental Assessment or an Environmental Impact Statement will be required. If an Environmental Assessment or an Environmental Impact Statement is required, the IEE will also provide the basis for its preparation. The IEE should identify and describe where appropriate: (1) the nature, scope and magnitude of any reasonably foreseeable effects of an action or any part of an action on the human environment; (2) the reasonably foreseeable effects on any such environmental impact on organisms in the biosphere including human life; and, where an Environmental Assessment or an Environmental Impact Statement is required, (3) reasonable alternatives to the proposed action which will be studied in detail in the Environmental Assessment or draft Environmental Impact Statement. The IEE will be an integral part of the Project Identification Document or equivalent document which will be circulated to selected Federal agencies for comment, when an Environmental Assessment is to be prepared.

B. Threshold Decision

A Threshold Decision is a formal Agency decision* which determines, based on an Initial Environmental Examination, whether a proposed Agency action is or is not a major action which will have a significant effect on the human environment and, if so, whether an Environmental Assessment or an Environmental Impact Statement is required.

C. Environmental Assessment

An Environmental Assessment is a detailed study of the reasonably foreseeable environmental effects, both positive and negative, of a proposed action and its reasonable alternatives carried out within or affecting specific developing countries. To the extent practicable, the Assessment will be developed in close collaboration with the host country institutions and subject to recipient country review.

D. Environmental Impact Statement (EIS)

An Environmental Impact Statement is a detailed study of the reasonably foreseeable environmental impacts, both positive and negative, of a proposed AID action and its reasonable alternatives, prepared when major Agency actions significantly affect: the global environment or areas outside the jurisdiction of any nation (e.g., the oceans);

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* The Guidelines need to provide explicit guidance on who is responsible for making Threshold Decisions, especially in light of delegation of authority to Mission Directors to approve projects up to $500,000.

the environment of the United States; or as a matter of policy, other aspects of the human environment at the discretion of the Administrator.

E. Negative Determination

A Negative Determination is a formal written document based on a Threshold Decision that a proposed action is not a major action which will have a significant effect on the human environment and is, therefore, an action for which an Environmental Assessment or an Environmental Impact Statement will not be required.

F. Negative Declaration

A Negative Declaration is an official written Agency decision made by an Assistant Administrator which states that the Agency will not develop an Environmental Assessment or an Environmental Impact Statement for an action which the Agency has identified as being ordinarily covered by AID Environmental Procedures. The decision may be based on: (1) overriding considerations such as the provision of disaster relief; (2) the fact that a substantial number of Environmental Assessments or Environmental Impact Statements relating to similar activities have been prepared in the past; or (3) the fact that the Agency has previously decided to prepare a programmatic Assessment or Statement covering the activity in question.

IV. Formats for Preparation of Initial Environmental Examination

It is desireable to prepare an IEE concurrently with the development of a PID; however, it is realized that basically the

PID serves as the first document which provides the general concept of a proposed project for development of the Congressional Presentation. Since the PID describes a program up to two years away, it may be too soon to prepare an IEE. There may be times when it is desirable to delay the preparation of the IEE.

Therefore the choice is given to the originator of a project to either:

a. present a complete IEE with the PID recommending a formal Threshold Decision, using Form IEE-A, or

b. request a delay of the IEE, using Form IEE-B.

(IEE-A and IEE-B to follow on pages 10 and 11)

FORM IEE-A

Face Sheet For

Initial Environmental Examination

(to be used when a Threshold Decision is recommended at time of PID submission)

Face Page, showing:

INITIAL ENVIRONMENTAL EXAMINATION

Project Location:

Project Title:

Funding (Fiscal Year and Amount):

Life of Project:

IEE Prepared by: Date:

Environmental Action Recommended:
(Environmental Assessment, Negative Determination, etc. Cite page where Recommendations for Environmental Action is fully stated in body of IEE.)

Concurrence: Date:
(By Mission Director or other appropriate official.)

Assistant Administrator's/Director's Decision Date:
(Approval/Disapproval of Environmental Action Recommended in the IEE. The Assistant Administrator/Director of the responsible Bureau or Independent Office reviews the IEE concurrently with the PRP or equivalent document.)

FORM IEE-B

Face Sheet For

Initial Environmental Examination

(to be used when an IEE is not included with PID)

PID ENVIRONMENTAL DISCUSSION

Project Location:

Project Title:

Funding (Fiscal Year and Amount):

1. Discussion (to include a discussion of why a complete IEE was not prepared).

II. Preparation of the IEE:

a) staff time required to complete IEE

b) funding requirement (if necessary)

i) Budget
ii) Source of funds

c) estimated completion date of the IEE

III. Recommendation:

The recommendation for a Threshold Decision will be deferred until the date specified in II.c above and funds (if required) specified in II.b are to be made available.

Approved _____ Date: _____

(State Assistant Administrator of the responsible Bureau, Mission Director or Independent Office Director).

Disapproved _____ Date: _____

Content of the IEE

Projects falling in categories 2 and 3, (Paragraph II D, on page 5) above should be prepared in the following format:

1. Description of the Project

The IEE should contain a sufficiently well rounded description of the various dimensions of the project and its setting so as to give the reader a reasonable understanding of the situation without reference to other project documents. The description should identify:

a. The project purposes and proposed activities.

b. The location and general area to be affected by the activity. A map, even if only an informal sketch, should be included.

c. Major land and water forms.

d. Present land use patterns.

e. Present population and population trends.

f. Present economic conditions and activities.

g. Social and cultural characteristics.

Project descriptions should be based on relatively easily available data, maps, and published information.

The narrative should follow the topical organization of the checklist, (see B2, below) contributing further explanation and discussion of the relative importances of the environmental issues identified. The narrative should conclude with a recommendation as to whether or not an EA or EIS should be undertaken. (Threshold Decision, III B; Negative Declaration, III F; or Negative Determination, III E.) The rationale for this conclusion must be part of the narrative.

If an EA or EIS is recommended, a preliminary identification of the subjects to be covered and the required expertise needed should be included.

2. Checklist

This Initial Environmental Evaluation Checklist (see Section VI) is primarily a screening process intended for use as a guide to the making of a decision on the question of need for an Environmental Assessment (EA) or E.I.S. (Environmental Impact Statement). The process of IEE completion may also serve as a stimulus to thought about the further environmental consequence of specific project design. Early consideration of the environmental implications of proposed activities could make eventual amelioration of consequences either unnecessary or easier. It should also ensure that developmental efforts will not eventually prove unsustainable or counter-productive because of environmental disruption or malfunctions.

The IEE checklist questions are broad, general, and somewhat redundant. They are intended to point out the obvious impacts and to direct thought towards consideration of environmental consequences which are often of great developmental significance. Questions cover changes to land use, soil, water and air conditions, as well as health and societal linkages to environmental condition. Discussion of source potential environmental impacts follows in Section 3. However some sectors may not be relevant to certain kinds of

proposals. A measure or definition of significance in response to checklist questions should draw upon judgment of the appropriateness of the proposed project in relation to the objectives of both AID and the host country.

3. Description of Possible Impacts*

A. LAND USE

Land should be prudently used for the management and conservation of the resources needed for the health and safety of man. Alterations of land forms or depletion of some of their natural defenses often take place over a period of years; nature's reactions usually take even longer. Therefore, analyses of proper land use tend to stress the long-term considerations over the short-term.

Some lands are affected relatively rapidly and irreversibly by seemingly small changes in an ecosystem. These areas are the particularly fragile ones such as rain forests, islands, and coastal lands.

Almost every development involves some use of land. Strip mining clearly changes the shape of the land. Other actions appear to retain the character of the land yet can have far-reaching deleterious effects. Therefore analysts should look into the role land plays in contributing to or conserving the health of a people or an area. Some of the land-use environmental impacts may involve:

1. Changing the character of the land through:

a. Increasing the population of people or animals in an area. Stress is put on the land through additional requirements for water, waste-disposal facilities, use of ground cover by grazing animals, roads, agricultural land, abodes, and a varied number of community services such as power and sanitation.

b. Extracting natural resources such as minerals or water. The baring of land for minerals can cause high erosion; moreover, the process water used in many mining operations can result in the discharge of volumes of highly acidic or alkaline waters, and of heavy metals. These discharges can pollute surface and ground waters, and prevent for a long period the use of any "downstream" land for agricultural purposes. The extraction of water from wells can lower the water table, causing subsidence of the land or, if the area is near the sea, salt water intrusion--i.e., salt water mixing with fresh to yield a brackish drinking or irrigating water.

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* These are not listed in order of precedence.

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c. Land clearing. The removal of ground cover takes place through almost every use of land. In addition to the impacts already noted, special problems may exist in tropical areas; for example, the clearing away of a tropical forest often reveals infertile soil, which is almost impossible to cultivate more than a season or two even with the help of fertilizers.

d. Changing the character of the soil. Slash-and-burn agriculture can destroy the replenishments of nutrients to the soil. Irrigation water can leach out needed trace elements in the soil. Erosion can take away the topsoil and increase a population's encroachment on forested areas. Overgrazing can remove ground cover, which in an arid and infertile area might never recover and lead to desertification.

2. Altering some of the significant natural defenses provided by an area. A wooded area such as a forest prevents flooding of lower or adjacent areas. Sand dunes and their grasses help maintain the stability of the landward areas. Long reaches of beach lessen the impact of the sea on the land; coral reefs act the same way. Mangrove forests prevent the sea from claiming more land; in fact, such forests build land.

Trying to stem some of the actions of nature could exacerbate a situation: groins built to maintain a beach could denude others; seawalls or breakwaters sometimes hasten shore erosion, or prevent the building of land on the leeward side of a barrier island or spit. Moreover, a mountain road poorly designed can direct waters from a flash storm in flood volume into lower lands or valley; or can take away just enough ground cover from the side of the mountain to cause erosion of the lower portion of the land.

3. Foreclosing important and perhaps better uses of the land. Scarce agricultural land may be flooded by a dam or partially lost to a roadway or airport. A marshland or mangrove lagoon, which are spawning grounds for many fish, may be filled for land developments. Other habitats for animals or other organisms which are used for food or are members of endangered species of worldwide importance may be destroyed. An aquifer recharge area may be eliminated by developments that could be put elsewhere.

4. Jeopardizing man or his works because either is put into a zone of potential disaster. A development may be planned for a flood-plain, near an active volcano, in an earthquake area, in the path of frequent typhoons or hurricanes, or in an area subject to locust or other plagues. The foregoing are natural disaster areas. There are also potential man-made disaster areas where land may be in the path of a weakly built dam, or an increasing load of water pollution.

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B. WATER QUALITY

Water is the solvent for many of man's waste products. It also is the vehicle for growth of all life on this planet.

The use of water for public water supplies, agricultural waters, industrial water supplies, recreational tourism, and as media for fishing and transportation depends intimately on the chemical, biological and physical states of the water. Overloading the capacity of water to absorb waste products, or altering its composition, will affect man's ability to use the water, sometimes critically. The impacts may involve:

1. Changing the physical state of the water. Increased siltation or sediment loads change the physical state of water. Activities bringing this about include: erosion runoff from new roads or near shore construction sites or resulting from deforestation or removal of ground cover; irrigation projects; dredging; discharge of solid wastes from processors such as sugar mills, pulp mills, refineries, steel mills, and such.

Changing the physical state of a water body usually changes the chemical and biological states; when sediments lessen the amount of light that penetrates a water body, photosynthesis is slowed down or stopped, thereby altering the ecological balance of the water body and bringing about associated biological and chemical changes.

Raising the temperature of receiving waters, say by the effluent of an electricity generating plant, changes the physical state of water. Similarly, dumping solid wastes such as construction debris will bring physical changes to a water body, as will the discharge of sewage sludge and garbage.

2. Changing the chemical or biological states of the water. A pollutant by definition causes deleterious changes in the state of water, usually of a chemical or biological nature. Pollution is introduced by sewage, leaking septic tanks, animal wastes washed into a stream or percolating into ground water, fertilizer similarly finding its way into ground or surface waters, and herbicides and pesticides contaminating the same waters.

Other sources of water pollution may stem from industrial discharges of wastes directly into surface waters, or into ground waters by injection of the wastes into deep wells or by allowing the wastes to seep down to the ground waters; spills or leaks of toxic materials such as oil; and the leaching into waters of accumulated salts from dumps and landfills, or from other substances subject to the dissolving power of the rain.

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Even the dumping of wastes seemingly far from any influence on the shorelands can, through unfortunate currents, bring some of the pollutants back to the land.

3. Changing the ecological balance of a water body, thereby changing its chemical and biological balance. For example, implanting alien organisms into a water body can bring about profound changes in that body: Newly introduced plant forms could proliferate and clog or eventually eutrophy a waterway; the addition of some predator fish could destroy the population of less aggressive fish which in turn might have kept an insect population under control.

Introducing toxics into a water body, especially a small one, could destroy much of the life there. Similarly, a habitat or ecosystem would be altered forever through land reclamation; e.g., by filling a swamp or marshland. These areas might be the feeding and nesting places for fish and animals which may play an essential part in the ecology of the region; these areas might also be one of the natural defenses of the area, such as a mangrove swamp.

C. ATMOSPHERIC

Airborne pollutants and some allegedly benign additives in sufficient concentrations and quantities can harm and destroy animal and vegetable life and cultural artifacts such as buildings, tapestries, and statues. In addition, airborne pollutants can alter the chemical characteristics of rain. Moreover, air pollution, by changing the reflectivity (albedo) of the atmosphere, can modify the weather and even climate of an area and possibly make the area more arid. Other intrusions into the atmosphere such as high levels of noise can modify and destroy a human community or a wildlife habitat.

Accordingly, atmospheric impacts may be grouped as follows:

1. Air additives. Spraying of herbicides and pesticides into the air--from aircraft or land-based dispensers--can harm or destroy life other than that targeted. Moveover, the additives can affect ground and surface waters, and eventually become concentrated in fish and thus in man in areas many miles from the source of spraying.

2. Air pollution. Particles and gases that can cause pollution may enter the atmosphere through industrial processes, engine exhausts, and the burning of solid wastes. Major air pollutants include: suspended particulates such as dust, pollen, ash, soot, metals, and various chemicals; sulfur dioxide; carbon monoxide, nitrogen dioxide; hydrocarbons; and the photochemical oxidants that are generated by the action of sunlight on chemical precursors.

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The effects of these pollutants include the aggravation of respiratory and cardiovascular diseases, reduced growth of plants and premature drop of their fruit and leaves, and the deterioration of building materials and other surfaces.

A particularly hazardous air pollution comes from the generation of dust during an industrial, construction, or mining process where workers are not protected from the particulates. In these instances, severe occupational diseases can be anticipated.

3. Noise pollution. Excessive noise--that is, noise that can impair hearing and some bodily and psychological functions, may be introduced by an industrial process or by vehicles. A riveting machine and a nearby jet plant takeoff make about the same painful noise; a heavy truck and a pneumatic drill make highly discomforting noise, about the same as a New York subway train pulling into a station.

D. NATURAL RESOURCES

Exploitable natural resources are those that can be taken from the sea, from the surface of the land or from beneath the ground, or extracted from the atmosphere. A major consideration from a community's viewpoint is the benefit expected from exploiting one of its natural resources. However, another consideration becomes one of determining the environmental effects of the resource's removal or diversion.

Natural resource environmental impacts may come from:

1. Diversion, storage or increased use of water. Dams, irrigation systems, watercourse diversion or channelization can profoundly affect people, animals, and other organisms that depended on the original sources of water. Entire species of organisms, and others that depended on them, could be harmed or destroyed. At the same time, other less desirable species could be encouraged. Far-reaching effects include the erosion of land, the spreading of desert lands, and the dissemination of diseases such as schistosomiasis.

2. Irreversible or inefficient commitments of natural resources. A plentiful natural resource might be taken without foreknowledge of the ecological role it plays. For example, sand might be extracted offshore without the realization that this sand may replenish a downstream beach; thus, a coastal area could be left defenseless. Precious coral could be extracted by primitive dredging methods, thereby destroying future crops and possibly a new industry. Animals such as goats or sheep could be released for pasture in an isolated area only to result in the destruction of the ground cover and also other perhaps

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valuable life there. Forests could be cut down for pulp without the realization of the role the forests may play in stemming floods, in protecting animal life, in storing water in a landform possibly adaptable for the hydroelectric generation of power.

E. CULTURAL

An activity may depreciate or seriously harm the culture or cultural heritage of a people. Culture may be defined in terms of the values a people hold, the consequent behavior patterns the people follow, and the knowledge and beliefs they have distilled from their forebears. Evidences of culture may be ensconced in (1) sacred or otherwise important waters and lands, historic and archeological sites, buildings and other artifacts, or other physical symbols; or in (2) a people's mythology, lore, ethics, history, teachings, activities, ethnology.

There are international conventions that now exist dealing with protection of the world cultural and natural heritage and with protection of endangered species. These conventions will ultimately indicate in each of the signatory countries those cultural and natural heritages and endangered species that need protection. Host country experts who are now a part of these activities should be consulted to obtain their views on possible impacts in this area.

Cultural impacts, although often subtle, can be pervasive and may involve:

1. Altering or destroying important physical symbols of a culture; e.g., monuments, sacred ground, ancient shrines, etc.

2. Diluting a culture, possibly through methods such as introducing alien cultures, or dispersing or otherwise adulterating the indigenous culture. For example, a forced mixture of populations could introduce alien ideas, as perhaps could direct TV broadcasts containing culturally erotic material. Resettlement of a population could break important cultural ties and thereby weaken a society dependent on site and on historic leaders.

It is recognized that cultural impacts and changes may be critically needed to help conserve the society.

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F. SOCIOECONOMIC

Socioeconomic impacts arise out of the striving of a people to earn a livelihood and to achieve a quality of life that provides a measure of food, housing and health. Thus, socioeconomic impacts may involve:

1. Changes in patterns of economic growth and employment. For example, a labor-intensive industry may move into a rural area because of the training and cheapness of labor there; or move out because these attributes of labor are offered elsewhere. Marginal agricultural land may be brought into production, bringing with it not only increased employment but also increased need for services such as water and roads. A marginal mineral deposit may be found whose exploitation could change the socioeconomic pattern of the area.

The factors that bring about economic changes are endless but often highly significant in socioeconomic impact analyses.

2. Movement, resettlement, or changes in population. This element is related to the use of land and community services, but the stress here is on the extent of change expected in the socioeconomic relationships among the people and between the people and their community.

3. Changes in cultural patterns that could affect socioeconomic patterns in a major way. For example, the persuasion of women to work, or the removal of children from the labor market would affect family income and relationships. Similarly, the eating of healthful but formerly taboo foods, which may be plentiful, or of unfamiliar food additives such as fish protein concentrate, could have large quality-of-life impacts on a people.

G. HEALTH

Impacts related to health broadly pertain to man and to the organisms and environments needed in large diversity and profusion to sustain man on the planet. These impacts may involve:

1. Altering or destroying a natural environment. Such changes could come about through the addition of chemicals to an environmental system to get rid of selected vectors of disease. For example, a copper compound can be added to a fresh water body to poison the intermediate (snail) host of schistosomiasis, but the poison will also kill other organisms. Similarly a larvacide could be used to help

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eliminate the chocerciasis (River Blindness) vector. Bush clearing or barricades could be used to destroy a tsetse fly colony but at the same time could jeopardize other organisms.

2. Eliminating an element in an ecosystem. The killing of coyotes to prevent crop destruction could give rise to the proliferation of the rodents that coyotes feed on. The destruction of mangroves to eliminate mosquitoes and other pests could give rise to the destruction by wave action of a coastline (see Item A2).

H. GENERAL

Some impacts are of overriding international interest and concern. Others, while not immediately apparent, may accrue to an overall program of which the proposed activity is a part, or an early step. Thus, general impacts may involve:

1. Activities that will affect the United States or other nations, directly or indirectly, now or at some later time. The agent for such impacts could be the ocean, the atmosphere, or carriers such as man, birds, or other organisms.

2. Activities that are matters of controversy locally, nationally, or globally.

3. Activities that are part of a larger program, or intended to be part of a larger program, whose total effect would require an appraisal of environmental impacts. If the activity fits this category, then use the present form for the appraisal of the entire and overall program.

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V. Review and Processing of IEE

The Assistant Administrator of the responsible Bureau, Mission Director or the Director of Independent Office will review the IEE concurrently with the PID or equivalent document and will make the Threshold Decision (or Negative Declaration if applicable). A line for his decision (approval or disapproval of the environmental action recommended in the IEE) should be included on the face page.

It might be noted here that when preparation of an EA is recommended, the PID, including the IEE, will be forwarded to other U.S. Federal agencies having an interest in the kinds of environmental impact involved. The reason for this is that these agencies may have technical expertise that could be helpful in advising on environmental evaluation. The appropriate Bureau or Independent Office will be responsible for circulation to other Federal agencies.

VI. IEE Checklist

(Impact Identification and Evaluation form)

This series of questions is split into two parts: A. Direct Changes; and B. Indirect Consequences. Each starts with questions concerning the physical environmental impacts and proceeds to social implications of possible environmental change. An attempt has been made to word all questions in a neutral mode so that an affirmative response could identify either a negative or a positive impact. Simply place an appropriate notation in the left hand margin. Use a Y for yes, and N for no, and a ? for maybe or unknown.

A. Direct Changes. Questions 1-19 fit into the blank space in the following question:

Does the implementation of this proposal require or cause significant (insert question here) within the project area?

_____ 1. Change in capacity to support an abundance of different kinds of plants and animals,

_____ 2. Alteration of important microclimates,

_____ 3. Change to specific places or routes which are of strategic biologic significance (such as breeding grounds, feeding areas, migration routes, winter or dry season range),

_____ 4. Alteration of supply, flows, or quality and location of waters,

_____ 5. Alteration of surfaces, including vegetation, soils,

_____ 6. Alterations of air quality,

_____ 7. Modifications of flows or cycles of nutrients, (such as might be caused by devegetation, irrigation leaching, exports of food, cattle, minerals, applications of fertilizers etc.),

_____ 8. Changes affecting the susceptibility of soils to accelerated erosion,

_____ 9. Alteration of extant agricultural systems, especially in genetic diversity of crops, animals, and combinations thereof.

_____ 10. Changes to human population, including relocation, (such as resettlement, infrastructure, family planning, etc.),

_____ 11. Change in contexts which might affect transmission of diseases of man, animal, plants,

_____ 12. Changes in nutritional status of human population(s),

_____ 13. Change to the rates and quantities of concentrated energy transformation (such as fertilizer use, power generation, adoption of petroleum engine, etc.),

_____ 14. Changes to the rates and quantities of non-renewable resource use,

_____ 15. Transformation of uses of land which may be of cultural significance (such as holy places, cemetries, supplemental fishing or hunting, or medicinal herb gathering),

_____ 16. Changes which alter either the potential for environmental hazards or the capacity to cope with them,

_____ 17. Possibility that waste products from the proposed activities will be fully utilized, contained within the premises, or properly disposed of,

_____ 18. Modification of capacity to utilize and distribute locally abundant resources, skills, information and materials,

_____ 19. Replacement of local land use systems of proven sustainability with others of questionable longevity,

B. Indirect Consequences. Although this section re-runs the previous topical questions, they are to be considered in a context of potential links to areas outside the immediate project region or site. Consideration should also be given to interrelationships between institutions and technology as they affect capacity to change in scale and intensity of environmental impacts.

Respond in the same way, with a Y, N or ? to the questions.

For areas or sectors outside the immediate or direct concern of the proposed project, are there significant probabilities that:

_____ 1. Some changes to habitats will alter capacity to support diverse and self-regulating sets of plant and animal populations?

_____ 2. Alteration of lands of marginal productivity will affect their capacity to provide a broad array of ecosystem services (such as: watershed protection provides nutrient cycling, water quality maintenance, oxygen, gatherable products, and aesthetic satisfactions)?

_____ 3. Non-reversible commitments of biologic resources will occur?

_____ 4. There will be changes in the qualities, flow rates, and consumption of waters?

_____ 5. Change to the rates, quantities, containment and cycling routes of waste products, including agricultural by-products, will occur.

_____ 6. There will be changes in the capacity of people to protect themselves from environmental hazards (such as disease transmission, flood, drought, cold, water pollution, pest populations etc.).

_____ 7. The locations chosen for infrastructure development will alter values of lands or places so as to cause serious changes in intensities of use that in turn alter ecologic viability (such as: a road may lead to settlement near the borders of a previously protected forest, leading thus to unintentional destruction).

_____ 8. Change to regional relationships of resource allocation would require either changes to or coordination with another project or country.

_____ 9. Changes in food supply structure would create changes in nutrition, health and/or poverty levels?

_____ 10. Given the circumstances of technology and social conditions, this proposal will be perceived as using the natural resources in a conservative and efficient manner? (does the project sacrifice the long range options of one ethnic group or national class for the benefit of another? Or, are the long range options knowingly being traded off?).

_____ 11. Alternations of landscape will affect the character of places which have significance to the history, ethnic identity, aesthetic well-being or cultural continuity of the people(s) involved.

_____ 12. Serious commitment to high energy content inputs will alter social structures, marketing connections, political dependencies, agricultural systems and resource availabilities.

_____ 13. This project will assist people to organize sustainable health services and technology in relation to changes in environmental conditions. (such as diet, disease vectors, sanitation, shelter).

_____ 14. The institutions developing from this proposal will have continuity of environmentally aware participant involvement in supervision and monitoring, including questions of conflict, both legal and political.

_____ 15. The developments sought will contribute to the establishment of incentives to conservation of natural resources.

_____ 16. The project will create changes which may become national or international political controversies.

For further guidance, see attached Section 3, paragraph IV, "description of possible impacts."

VII. Copy for Handbook III

1. Covenant proposed as standard covenant in loan or grant agreement when it is necessary to authorize said loan/grant before the EA can be completed:

> "The (host government) agrees to review the Environmental Assessment and to consider its findings in post-authorization design and implementation stages of the project."

2. EA Time Constraints:

Background:

Every attempt should be made to abide by the spirit of AID policy as defined in 216.1 (b) (1): "To ensure that the environmental consequences of proposed AID-financed activities are identified and considered by AID and the host country prior to a decision to proceed ---." In order to do this, 216.3 (a) (3) states "Final approval of the Project Paper --- and the method of implementation will include consideration of the Environmental Assessment ---," and in 216.1 (a) "These procedures have been developed to insure that environmental factors and values are integrated into the decision-making process," and in 216.5 (a) "The Environmental Assessment will be considered by AID prior to final approval of any activity."

However, in the cover letter on CEQ's draft NEPA regulations, they define as a major issue yet to be resolved the integration of AID's environmental requirements to the budget process, strongly implying that further modifications will be made. Even in the existing regulations the need for

flexibility is indicated in the continuation of 216.3 (a) (3): "If loans or grants for broad sector activities are proposed, a general or programmatic Environmental Assessment --- consistent with the scope of the proposed loan or grant will be prepared in conjunction with the Project Paper and agreement will be reached that a detailed assessment will be prepared and considered on each individual project as it is developed and prior to its approval."

Unfortunately in the real world of AID this flexibility does not go far enough. Projects can be suddenly moved up from more distant planning phrases because of political expediency or for other reasons. When this occurs, AID's budget process places constraints which might well compromise the integrity of an EA that has to be completed in time for an authorization deadline. Therefore an additional dimension is needed which would allow writers and reviewers in the IEE process to weigh or judge the comparable benefits of a time-compressed EA which could meet the dealine but not be as thorough, against a more detailed EA which might surface additional considerations even though authorization has taken place and some implementation may have begun.

Recommendation: It is suggested that in such instances the the same principles as expressed in 216.3 (a) (3) be exercised, with the modification that instead of a programmatic EA being done, the IEE could simply specify the time needed for a comprehensive EA, recommending deferral of its completion until such a time. Language could appear in 216.3 (a) (3).

3. Threshold Decision:

Discussion: A disparity is implied between part VII of the IEE guidelines, which state that the Threshold Decision is made by the responsible AA, and language in 216.4 (a) of the regulations under Responsibilities: "As a general principle, responsibilities for environmental decisions and actions will be similar to normal AID responsibilities ----. Thus each AID official empowered to authorize funds will be responsible to the Administrator for implementing these procedures and obtaining and managing the required resources."

This can be interpreted as the transfer of authority to make a Threshold Decision. If so, it should be more clearly delineated in both the regulations as well as Handbook 3 and the IEE Guidelines. For example, it is possible that the definition of projects which can have a shorter reviewing process could include in the frame of reference limits according to the amount of funding, the kinds of projects, or other characteristics. The importance of clarifying this telescoped procedure for certain kinds of projects is related to the expediency of the circulation of IEE's under this abbreviated procedure which recommend EA's and would be circulated to other Agencies for comment. It would also have an effect on the Bureau or Office which is charged with obtaining contract services to do EA's.

CLARK UNIVERSITY

Workshop in Environmental Investigation

February 19 to March 3, 1978

Roster of Participants

AID Mission Officers:

Donald L. Atwell
Deputy Country Development Officer
Ouagadougou, Department of State
Washington, D.C. 20520
or
B.P. 35
American Embassy
Ouagadougou, Upper Volta

Herbert Blank
General Engineer
Sana/ID (Yemen)
Department of State
Washington, D.C. 20521

Richard M. Dangler
Assistant Director/CD
USAID-Philippines
APO San Francisco, California 96528
Telephone: 59-80-11 Ext. 449

Ernest F. Gibson
Agriculture Economist
USAID, c/o American Embassy
Tunis, Tunisia
Telephone: 282.566

Roy A. Harrell, Jr.
Assistant Program Officer
U.S. Embassy (ADO)
Niamey, Niger W. AFRICA
Telephone: F2-26.61 Ext. 225

Tibor Nagy
Port Au Prince (Haiti)
Department of State
Washington, D.C. 20520
Telephone: 2-3765

AID/Washington:

William Ackerman
Environmental Officer
Asia Bureau
Agency for International Development
Washington, D.C. 20523
Telephone: 202-235-8949

Curtis C. Andersen
Public Health Advisor
AFR/DR/H
Washington, D.C. 20523

David E. Dibble
Environmental Officer
Africa Bureau
Agency for International Development
Washington, D.C. 20523
Telephone: 202-632-1763

Chris Field
Development Studies Program
USAID, Department of State
OPT/PS&CD/DSP
Pomponio Plaza, Bldg. 439
Washington, D.C. 20523
Telephone: 703-235-1339

Brent Gatch
General Engineer
USAID, Demascus (Syria)
Department of State
Washington, D.C. 20521

Dr. Nels Konnerup
Livestock Diseases Specialist
DSB/AGR, USAID
Washington, D.C. 20523
Telephone: 701-235-1275

AID/Washington: (con't)

Molly Kux
Environmental Affairs Officer
Office of Science & Technology
(DS/OST), USAID
Washington, D.C. 20523
Telephone: 202-632-2418

Related Organizations:

Herman H. Barger
Senior Policy Officer
Inter American Development Bank
808 17th Street
Washington, D.C.
Telephone: 202-634-8776

Robert E. Wilson
Agricultural Production
Specialist
AFRICARE
1601 Connecticut Avenue, N.W.
Washington, D.C. 20009
Telephone: 202-462-3614

Workshop Staff:

Eileen Berry
Graduate Fellow
Department of Geography
Clark University

Leonard Berry
Professor of Geography
Co-Director, International
Development Program
Clark University
Telephone: 617-793-7201

Saul B. Cohen
Professor of Geography
Dean, Graduate School of
Geography
Clark University
Telephone: 617-793-7325

Cynthia H. Enloe
Professor of Government and
International Relations
Clark University
Telephone: 617-793-7497

Richard B. Ford
Associate Professor of History
Co-Director, International
Development Program
Clark University
Telephone: 617-793-7201

Charles Hays, MD
Associate Professor of Community
and Family Medicine
University of Massachusetts
Medical School
55 Lake Avenue
Worcester, Massachusetts 01605
Telephone: 617-856-2326

Douglas Johnson
Associate Professor of Geography
Clark University
Telephone: 617-793-7370

Lawrence Lewis
Associate Professor of Geography
Clark University
Telephone: 617-793-7176

Liberty Mhlanga
Environmental Training Program
(ENDA)
BP 3370
Dakar, Senegal
Telephone: 505-91

Harry E. Schwarz
Visiting Professor of Environ-
mental Affairs
Clark University
Telephone: 617-793-7375

Workshop Staff: (con't)

Earl Scott
Associate Professor of Geography
University of Minnesota
Minneapolis, Minnesota 55455
Telephone: 612-373-4602

Janet Townshend
Administrative Assistant
Clark University
Telephone: 617-793-7201

John Townshend
Visiting Professor of Geography
Clark University
University of Reading, U.K.
Telephone: 617-793-7291

Guests and Short-Term Visitors:

Carlyn Pitts
AID Training Programs
Agency for International Development
Washington, D.C. 20523
Telephone: 703-235-9082

Albert Printz
DSB/Environmental Specialist
Agency for International Development
Washington, D.C. 20523
Telephone: 202-235-9035

Dor Bahadur Bista
Visiting Fellow
Columbia University
New York, New York
Former Consul General from Nepal to Tibet

Michael Horowitz
Institute of Development Anthropology
State University of New York
Binghamton, New York
Telephone: 607-798-2468

Daniel Okun
IPEAD Director
School of Public Health
University of North Carolina at Chapel Hill
Chapel Hill, North Carolina
Telephone: 919-966-1023

Research Assistants:

Mercy Amundsen

Clare Hilliker

Lenny Kreppel

Ken Mandel

Donna Nevel

Seth Nyako

Mike Phoenix

Haleh Pourafzal

Bonnie Ram

Bob Reynolds

Dave Robbins

Pamela Vernick

International Development Office:

Program for International Development
Room 205, Academic Center
Clark University
Worcester, Massachusetts 01610
Telephone: 617-793-7201

CLARK UNIVERSITY

Workshop on Environmental Investigation

Roster of Permanent Addresses

22 May - 2 June 1978

Name: ALARCON, EDILBERTO

Mission Address (or business address):

USAID/Peru
Av. Espana 386, Apt. 1995
Lima, Peru

Permanent Address:

[redacted]

Business Phone: 286-200

Home Phone: [redacted]

Name: BARTLETT, ROBERT

Mission Address (or business address):

Accra (IC)
Dept. of State
Washington, D.C. 20520

Permanent Address:

[redacted]

Business Phone: 75055 (Accra)

Name: BOYD, BESSIE L.

Mission Address (or business address):

AID - AFR/DR/SDP
Room 2484 NS
Washington, D.C. 20523

Permanent Address:

[redacted]

(Bessie Boyd), cont.

Business Phone: 202-632-8570

Home Phone: [redacted]

Name: CLARK, DON

Mission Address (or business address):

USAID
B.P. 35
Ouagadougou, Upper Volta

Permanent Address:

[redacted]

Business Phone: 341-40 (Ouagadougou)

Home Phone: [redacted]

Name: FLUEGEL, CHARLES J.

Mission Address (or business address):

Lutheran World Relief
360 Park Avenue South
New York, New York 10010

Permanent Address:

[redacted]

Business Phone: 212-532-6350

Home Phone: [redacted]

Name: FORT, VERNITA

Mission Address (or business address):

AID
OS/AGR/TSWM - Rm. 413 RPC
State Dept.
Washington, D.C. 20523

(Vernita Fort), cont.

Permanent Address:

Business Phone: 703-235-1497

Home Phone:

Name: FREUNDLICH, STEVEN J.

Mission Address (or business address):

USAID
Kathmandu (ID)
Dept. of State
Washington, D. C. 20520

Permanent Address:

Business Phone: 703-235-8910 (AID/W-ASIA/PD)

Home Phone:

Name: GAVIDIA, C. ROBERTO

Mission Address (or business address):

USAID
El Salvador
U. S. Embassy
San Salvador
El Salvador
Central America

Permanent Address:

Business Phone: 25-7100

Home Phone:

Name: GEPHART, DAVID

Mission Address (or business address):

Sana (ID) Yemen
Dept. of State
Washington, D. C. 20520

Permanent Address:

[redacted]

Business Phone: Day's Lodge Room 220

Home Phone:

Name: GUIOT, HOWARD V.

Mission Address (or business address)

American Embassy
USAID - Monrovia, Liberia
APO 09155 - New York

Permanent Address:

[redacted]

Business Phone: 26988

Name: HULEHAN, JEROME

Mission Address (or business address)

USAID/Nairobi
Nairobi, Kenya

Permanent Address:

[redacted]

Business Phone: 331160

Home Phone:

Name: ILLICK, J. ROWLAND

Mission Address (or business address):

Nouakchott Mauritania
Dept. of State, USAID
Washington, D. C. 20520

Permanent Address:

[redacted]

Business Phone: 802-388-4051

Home Phone: [redacted]

Name: JACKSON, LEROY

Mission Address (or business address):

USAID Kinshasa
APO New York 09662

Permanent Address:

1[redacted]

Business Phone:

Home Phone: 3[redacted]

Name: JEPSON, LANCE H.

Mission Address (or business address)

Bamako
c/o U. S. Embassy
Dept. of State
Washington, D. C. 20521

Permanent Address:

[redacted]

Business Phone: None

Home Phone: [redacted]

Name: LEAVENWORTH, PHILIP B.

Mission Address (or business address)

Save the Children
Community Development Foundation
48 Wilton Road
Westport, Connecticut 06880

Permanent Address:

Same

Business Phone: 203-226-7271

Home Phone: [redacted]

Name: REITZE, HERNAN

Mission Address (or business address)

The World Bank
Room: E-1044
1818 H Street, N. W.
Washington, D. C. 20433

Permanent Address:

(Same as Above)

Business Phone: 202-477-6940

Home Phone: [redacted]

Name: RODRIGUEZ, HERIBERTO

Mission Address (or business address)

USAID/Costa Rica
U. S. Embassy
San Jose
Costa Rica

Permanent Address:

[redacted]

Business Phone: 22-55-66

Home Phone: [redacted]

Name: ULLRICH, RONALD E.

Mission Address (or business address):

American Embassy
Santiago
APO - N. Y. 09869

Permanent Address:

Same

Name: VON SPIEGERFELD, WOLFGANG

Mission Address (or business address)

USAID Damascus
Damascus (ID)
Dept, of State
Washington, D. C. 20520

Permanent Address:

[redacted]

Business Phone: 331878 Damascus SAR

Home Phone: [redacted]

Name: WITT, ERIC N.

Mission Address (or business address)

Yaounde (ID)
Dept. of State
Washington, D. C. 20520