A DEMONSTRATION ENVIRONMENTAL TRAINING COURSE FOR POLICY MAKERS FROM DEVELOPING COUNTRIES

An Evaluation of an AID-UNIDO Environmental Training Course Held at The University of North Carolina, Chapel Hill, January 22-April 2, 1973. Prepared by:

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APPENDICES

I. Introduction

The International Training Program in Environmental Aspects of Industrial Development was held at the University of North Carolina, Chapel Hill, from January 22 to April 2, 1973, under the joint sponsorship of the Agency for International Development (AID) and the United Nations Industrial Development Organization (UNIDO). Twenty-nine participants from 18 countries attended the 10½-week course.

The program was conceived and implemented as a pilot project: a first-of-its-kind environmental training course specifically for policy makers from developing countries. Because of its experimental nature, and the current widespread interest in environmental training which exists within the international community, the sponsoring institutions and the contractor agreed at the outset to undertake an evaluation of the program as it evolved. The University of North Carolina obtained daily commentaries from participants on the lectures and field trips, held periodic evaluation sessions for both faculty and participants, and required a written analysis of the program from participants at the end of the course. Informal comments were also obtained by AID from visitors to the program which included representatives of the Council on Environmental Quality, the Environmental Protection Agency, and the Woodrow Wilson International Center for Scholars (Smithsonian).

In addition, AID established a three-man team -- composed of representatives from the Office of Science and Technology, the

Office of International Training and the Bureau for Program and Policy Coordination -- to evaluate the content, quality and impact of the initial course and, beyond that, to make recommendations on whether and in what form, such training should be continued in the future.

The evaluation team made a two-day visit to North Carolina during the second to the last week of the course at which time the program was intensively discussed with the participants, program staff, faculty and principal lecturers. In addition, the participants' research papers and evaluation questionnaires were reviewed. Earlier, two members of the team had attended classroom lectures, and one accompanied the group on a field trip. The program was also discussed with the participants on their final day in Washington. An additional input was provided by the University of North Carolina's descriptive report on the course, which also contains an evaluation and recommendations (available from the Office of Science and Technology, AID).

Throughout its evaluation, the team attempted to make judgments and reach conclusions about the course on the basis of whether it appeared to give the participants an appreciably better understanding of environmental issues and options, and the motivation and means to systematically address the environmental aspects of their individual job responsibilities.

The University of North Carolina and, in particular, the Department of Environmental Sciences and Engineering, is commended for proposing this new training initiative, as well as for the dedication and effort that went into developing and presenting the course. The evaluation team is especially appreciative of the cooperation and hard work of the Program Director, Mr. Ronald Sims, and the Program Coordinator, Ms. Charlotte Hermann.

II. Evaluation of North Carolina Program

A. Background

The concept of an international environmental training program designed specifically for officials from developing nations arose from a proposal that the Department of Environmental Sciences and Engineering of the University of North Carolina's School of Public Health made to the United Nations Industrial Development Organization (UNIDO) in January 1972.

Two months later, a meeting involving the Environmental Protection Agency (EPA), HEW, AID, UNIDO, and the University was held in Washington to consider possible sources of U. S. funding. Both EPA and HEW endorsed the program but referred the proposal to AID since they do not have statutory authority to support international training courses of this type. AID, however, had both the mandate and the interest. The new AID Committee on Environment and Development was in the process of evaluating whether the Agency should support environmental training and, at the Committee's

request, both the Office of International Training and the Office of Personnel and Manpower were conducting surveys on environmental training needs and potential sources of such training. Responses to an airgram subsequently sent to AID field missions indicated that there was sufficient country interest to justify AID support of the proposed course on a pilot basis.

AID's Office of Science and Technology assumed responsibility for the project and, as a first step, requested the following basic changes in the original proposal to bring it more into line with AID interests: (1) the target group be re-defined as senior policy officials able to influence decisions on the location and operations of industrial plants rather than "individuals with management responsibilities" as originally proposed; (2) the course content be revised to include technological, institutional and legal means for solving problems, as opposed to a program focus on problem identification and impact analysis; and (3) the classroom schedule be adjusted to make it more relevant to developing countries, for example, by spending more time on water quality and less on noise pollution. Both the University of North Carolina and UNIDO agreed to these changes and the proposal was revised accordingly.

AID signed a contract with the University of North Carolina on June 30, 1972 for $120,000 to cover the costs of the design, implementation and documentation of the course, as well as travel

and administrative costs for 20 participants. A separate agreement was concluded between UNC and UNIDO in September, 1972, under which UNIDO support would be provided for up to 10 additional participants.

B. Objectives

The purpose of the program, as stated in the University of North Carolina's final course description, was "to train senior personnel from developing countries in the identification, analysis and appropriate solution to environmental problems associated with ...both proposed and existing industrial facilities and developments in their parent countries."

AID viewed the course as a pilot project designed to determine whether an "overview" approach to environmental training could attract key people from the LDCs, and successfully provide them with the perspective, knowledge and motivation required to influence policy back home. A non-technical, policy-oriented course was envisioned based on the belief that environmental sensitivity must initially be fostered at the upper levels of LDC decision-making if meaningful progress is to be made in the near term. Further, the technical aspects of environmental protection are too many and varied to be covered adequately in a short course and, in addition, a number of technical training courses which appear suitable for LDC experts already exist.

The industrial focus of the course combined UNIDO's particular mandate with the view of AID's Office of Science and Technology

that the industrial sector placed manageable limits on the vast "environmental field" yet was sufficiently large to serve as an integrating mechanism for a spectrum of interrelated environmental problems and policy issues. Most of all, it provided an area which, based on U. S. experience, enabled the training to go beyond problem identification to deal with alternative techniques and methods for controlling the problems.

On balance, the AID evaluation team feels that the objectives of the program were appropriate and, in most cases, achieved. This includes the testing of both: (a) the concept of "overview" environmental training for LDC policy makers; and (b) whether it is possible for the U. S. to develop and present a relevant training course to an international audience based on its own unique set of experiences.

The degree to which the objectives were not met reflects, in part, the inherent difficulty of dealing with an area as large and complex as environmental protection -- an area in which the state-of-knowledge is in its infancy, particularly with respect to needs of the developing world. Conducting an environmental training program such as that attempted is therefore immeasurably more difficult than putting on a training program in a single, established field. It is in this context that the problems encountered in this program are evaluated. They are perceived largely as the growing pains inherent in any new experience.

Discussions between the AID evaluation team, the University's program staff, and UNIDO representatives revealed that a common understanding and appreciation existed among the participating institutions with respect to the broad program objective: namely, the conduct of an overview training course for LDC policy makers on the environmental aspects of industrialization. However, among the attending participants, there was a significant number who stated that the course differed markedly from what they came for. Some felt that it was supposed to be technical in nature but proved to be elementary; others claimed they understood that the course was to provide a broad overview, but that it turned out to be too technical.

The reason for this confusion is difficult to assess, but probably results from a combination of factors including: failure of the course announcements to properly convey the message; misinterpretation of the announcements by the participants; improper selection of some individuals who are technically-oriented by reason of both background and present position; and the University's choice of the level of presentation and information content of the course.

AID and UNIDO sent separate announcements to the field which differed to some extent in format, wording and emphasis (see Appendix B). In addition, each agency selected its own participants. The fact that the UNIDO participants were generally more

technically oriented may be a reflection of the more advanced stage of development of the countries from which they came (e.g., Eastern Europe, Brazil, Singapore), but also may relate to the wording of the UNIDO announcement which described the training as useful for, among others, "upgrading analytical capabilities."

In addition, the "industrialization" focus of the course may have misled many candidates and potential condidates into assuming that it was a technical course for industrial operators and technocrats. However, this focus had been envisioned merely as a useful mechanism for getting broad-gauged LDC policy planners to consider the full range of environmental problems, issues, and options associated with a single, integrated development sector.

The two sponsoring agencies had agreed at the outset to recruit on a world-wide basis, and to involve the maximum number of countries. Since most countries nominated only one or two individuals, several with marginal qualifications were selected, and the group as a whole displayed the widest possible range of backgrounds and interests. Some turned out to be primarily interested in technology; others were concerned mainly with policy. Those with engineering backgrounds and working in technical areas such as water supply, air pollution and waste disposal desired in-depth coverage of methodologies and technologies in their particular areas of interest. On the other hand, those concerned with policy planning and coordination were looking for extensive coverage of environmental economics, legislation, organization and management. To some

extent, both groups were disappointed. Participant expectations were so mixed that they could not be met by a single course.

A final factor that reduced the overall effectiveness of the course was the difficulty and uncertainty the faculty had in determining the proper level at which to present the course material. Although UNC faculty independently stated that they were presenting a generalized "sensitizing" course, nonetheless, many of the lectures dealt with rather narrow topics and in quasi-technical terms, in part attributable to the fact that UNC's Department of Environmental Sciences and Engineering is oriented toward the technological aspects of air and water pollution. Thus, the material came across as too elementary for some and too technical for others.

C. Participants

The quality, and success, of a training program depends heavily on its participants -- and is therefore directly dependent on the process through which the trainees are selected.

The program announcement sent to AID Missions in August 1972, requested nominations of participants in positions to translate new knowledge into industrial policies and management decisions... (e.g., second level planners and managers from ministries and government agencies involved in industrialization; key educators in industrial training fields; and top personnel from industrial research institutes)." The announcement said that the program

would be centrally financed by the Technical Assistance Bureau's Office of Science and Technology, and asked each Mission to submit up to four nominations. It went on to say that "AID/W will make the final selection of participants in consultation with the University of North Carolina."

The announcement brought 31 nominations from 13 AID-countries (Argentina, Brazil, Chile, Nicaragua, Panama, Paraguay, Indonesia, Korea, Philippines, Turkey, Ghana, Kenya, Tunisia). An additional six Missions (Bangladesh, Botswana, Ethiopia, India, Swaziland, and Viet Nam) noted that while the governments were not prepared to participate in the first course, there was a good chance that, given a longer lead time or improvements in political situations, participation in future courses could probably be expected.

Using criteria which included an ability to influence decisions at home, competence in English, and a maximization of participating countries, the 31 applications were reviewed jointly by AID and the University of North Carolina. Twenty candidates and four alternates were selected. The number of AID-sponsored trainees eventually ended up at 19 when the Nicaraguan candidace had to drop out at the last minute.

UNIDO, which had received copies of the AID announcement and distribution list, sent its announcement to the field through UNIDO and UNDP representatives. It went to 30 countries, including several in Eastern Europe plus other advanced non-AID countries.

Deliberate overlap with AID was carried out in eight developing nations.

Forty-two applications were received for UNIDO fellowships, a good response given the fact that the announcements were not distributed until the first of October for a program scheduled for January. Participant selection was based on the University of North Carolina's evaluation of tentative recommendations made by UNIDO. Ten trainees were formally invited (and all eventually attended) from: Indonesia, the Philippines, Singapore, Thailand, Israel, the UAR, Mexico, Hungary, Poland, and Romania.

In all, 29 participants from 18 countries attended the course.

Twenty-one of the twenty-nine participants were government employees. The other eight were employed by private industrial firms (3), industrial research institutes (2), universities (2), and intergovernmental institutions (1).

Twenty-two stated that they held supervisory or managerial positions of responsibility at home. Twenty indicated that they were directly involved in activities which had an "environmental" component: 13 in management and design aspects of pollution control, and 7 in regulatory and licensing functions.

In terms of educational backgrounds, 15 of the trainees had engineering degrees; 5 had degrees in public health and related fields; 2, liberal arts; and 1 each in industrial research, agriculture, biology, physics, law, architecture, and mathematics.

Four held Ph.D. degrees, and 21, a Master's or equivalent advanced degree. Since most of the participants had engineering backgrounds, a number displayed a bias toward the technical aspects of rather narrow segments of the environmental spectrum, sometimes to the point of objecting to the time spent on, e.g., water pollution since they were interested mainly in air quality.

It is not easy to determine how many of the participants actually held policy jobs at the desired level. Discussions with participants and UNC faculty indicate, however, that few were senior government policy makers. Nevertheless, most held the kinds of responsible positions that should enable them to put their North Carolina experience to effective use when they return. It is also worth noting that review of application forms showed that the candidate's initial description of his job responsibilities did not always coincide with what he described after his arrival.

University of North Carolina lecturers and staff members uniformly characterized the participants as an unusually able group of individuals. UNC felt that the UNIDO participants generally held more responsible positions and were better informed about environmental matters than the AID-sponsored trainees. This may reflect the fact that most of the UNIDO people were drawn from more developed countries -- Poland, Hungary, Romania, Israel, Mexico and Egypt. Also, UNIDO had 42 applications from which to choose 10; AID, only 31 from which to choose 20.

As previously mentioned, the broad variety of backgrounds and interests among the participants made it difficult for a single course to meet their needs. With respect to the value of the geographical dispersion of the participants, it is difficult to draw conclusions -- although UNC faculty queried on this point felt that the interaction of different cultures and perspectives was healthy and stimulating, and overrode any problems. It was clearly evident, however, that any advantages in multi-disciplinary exchanges between technicians and generalists who are placed together in a single course are offset by the nigh impossible task of designing a training program that meets such widely divergent needs. The evaluation team believes that a more careful selection of participants (and from a larger number of nominations) can introduce more uniformity -- and, hence, satisfaction and value -- into future courses. It seems reasonable that this can be achieved by (1) providing adequate lead times for nomination and selection; (2) spelling out clearly in program announcements the orientation and goals of the course; (3) and requesting active participation in the selection by overseas missions of the sponsoring agencies.

Another factor that should promote attendance by senior policy officials is a shortening of the program. Several candidates said that their superiors were interested in the course and would have benefited to a greater degree, but couldn't break away for the eleven weeks required. Environmental workshops, conducted in the

LDCs, is one approach to attracting top-level decision makers unable to leave their jobs for more than brief periods.

2. Course Structure and Content

The program included both classroom training and field experience. The first six weeks consisted of formal instruction which covered air and water pollution, water supply, solid waste management, and industrial hygiene (see Appendix C). Lecturers dealt with the identification and analysis of associated environmental problems as well as technological options for their prevention or control; the effects of industrial pollution on community health and development; costs associated with pollution abatement measures; and the design and implementation of control programs. Also included were lectures and discussions on industrial siting, legislation, regulations and standards, environmental audits, and economic, political and social constraints on environmental protection.

To ensure that the participants were exposed to a wider variety of viewpoints and experiences than is available from a single source -- in this case, UNC's Department of Environmental Sciences and Engineering -- AID specified that course lecturers should be drawn, in part, from outside the University. Consequently, lectures were given by thirty people, nearly half of whom were from the outside. They included professors from other universities (e.g., Harvard and West Virginia); consulting engineers (e.g., Teledyne-Brown of Huntsville, Alabama) and representatives of Federal and State environmental control agencies (e.g., CEQ, EPA).

Class sessions took place in the morning with the afternoon devoted to discussions (except for five afternoons when field trips were made to industries and research establishments in the Chapel Hill-Raleigh area). Notwithstanding that the lectures were interspersed with discussion periods and field trips, some participants felt that the basic lecture approach should have been replaced by seminar techniques.

The classroom period was followed by three weeks of field trips -- for which the participants split into three groups on the basis of their indicated preferences. A heavy industry group visited 11 sites which included the Department of Pollution Control in Tallahassee; Wellman Power Gas, Inc., Lakeland, Florida; and the Lonestar Cement Plant in Birmingham, Alabama. A light industry group went to 9 sites (e.g., Mechlenburg County Health Department, Charlotte; Sanford Brick and Tile Co., Sanford, North Carolina; and the Department of Natural Resources in Atlanta). A mechanical and electrical engineering industry group visited 7 sites, including TVA and Raccoon Mountain Pump and Storage Station in Tennessee; and the National Environmental Research Center in Cincinnati.

Each participant spent the last week of the field phase at a particular plant or agency of his choice to undertake a detailed analysis of its environmental activities, responsibilities, and problems. These one-week, individualized programs involved such diverse institutions as the National Fertilizer Development Center and the Council for Environmental Quality. The final week of the

program was reserved for writing a report on the field study. Each participant was also required to prepare a research paper during the classroom phase of the program.

Each facility which participated in the field trip portion of the program had been visited by UNC staff in advance to solicit their involvement and to reach an understanding about the type of program best suited to the unique group of trainees. Nevertheless, the quality of the field visitations varied widely. While some plants presented interesting, informative and well-organized programs, other presentations were little more than generalized "sales pitches" with little relevance and information content. Also, the field trip schedule was overcrowded, particularly since some of the groups had to travel long distances to get to the next plant. This left little time for questions at many of the stops, and the participants were sometimes too tired from traveling to get much from the visit.

Selection of a <u>smaller</u> number of high quality plant visits is a must for future courses. In that regard, the experience gained in this initial training effort is invaluable. More difficult, however, is the choice of specific types of industries and technologies to be included. The University designed the field portion of the course to display the full range of industrial problems and approaches to environmental protection -- from small, labor-intensive industries with small investments in pollution control to large, capital-intensive plants with sophisticated pollution abatement technology (e.g., Kaiser Aluminum). Some of the participants

believed that several of the visits were irrelevant. However, there was no general consensus on the visits, since representatives from the more advanced countries were not interested in the smaller industries, and participants from the less developed countries felt that they did not gain much by visiting some of the large, capital intensive plants.

E. Coordination and Administration

Program coordination and administration was vested in the UNC Department of Environmental Sciences and Engineering. The University provided a senior program consultant on a part-time (10 percent) basis; a full-time project manager; and a full-time administrative assistant. It had been envisioned that the project manager would insure overall program coordination and coherence by, among others, briefing the lecturers, attending all classroom sessions, and tying the material together with post-lecture and post-field trip comments, and by conducting end-of-the-week recapitulations and previews.

The requisite coordination never did take place as envisioned, or required. The University found it impossible to obtain a senior staff member to serve as project manager since the 10½-week program fell in the middle of an academic year term, and none of the teaching faculty was willing to give up other responsibilities and opportunities for this "one-shot" program. UNC consequently hired from the outside a recent graduate of the Department to serve as coordinator. Although he was able, well qualified technically and an extremely hard worker, the fact that he was inexperienced and much younger than most

of the participants curtailed his effectiveness. In addition, he was diverted from attending classroom sessions and other activities by a variety of unexpected necessities: finding substitute speakers, revising field trip schedules, obtaining information resources recommended by speakers and requested by participants, etc.

In retrospect, a more senior staff member was needed, supplemented by a full-time assistant. The senior faculty member could have performed a very useful role by relating the presentations of the UNC and guest lecturers to each other and by participating in the afternoon discussions. This was done in a few cases -- and with considerable success -- by the program consultant and Department chairman.

Another aspect of program coordination involves the integration of the various program elements. The course material and the field trips could have been arranged to support each other more directly. Afternoon field trips during the classroom phase might have been better planned, and also better timed to tie directly into the material being covered in the lectures and discussions. Future courses might benefit from use of the case study method to relate classroom material more closely to field trips. This would require more unified planning of the course material, and probably fewer lecturers and field trips.

A number of administrative problems arose. These involved such items as coordination of international and domestic travel, transportation for field trips, book purchases, and housing accommodations.

They were, in sum, relatively minor but nonetheless detracted from the generally high morale of the participant group. Participants wanted more freedom in the choice of books they could buy; all felt that the dormitory accommodations without private bath were spartan and very inconvenient. Minor differences in the handling of UNIDO and AID participants were cited -- for example, UNIDO-sponsored trainees had an opportunity to visit New York at the end of the program.

III. Conclusions and Recommendations

The preceeding sections have dealt with individual aspects of the UNC demonstration training course, and have highlighted shortcomings, problem areas, and issues. This section summarizes those views, and also presents the evaluation team's recommendations with respect to possible AID support of future international environmental training programs.

The more significant problems associated with the UNC course were reflections of too varied a mix of participants, the lack of integration of the various program elements, and an unevenness of course content manifested mainly by complaints of the more broad-gauged participants that the material was often too technical. The problems were due in large part to inexperience. The environmental area, particularly as it concerns development in the LDC's, is a new subject, and there are few organizations experienced in conducting environmental programs. This is why it was deemed necessary to pursue the UNC course as an experiment.

In the sense that problems were expected, and that many were defined and analyzed, the course served its intended purpose. The problems encountered are remediable. The evaluation team believes that what was learned justifies repeating the course, albeit with significant changes. Also there is no doubt that the participants have gained valuable information, experience, and--hopefully--an expanded perspective which will be of significant value to them in their work back home.

Discussions with the participants reinforced the impression that there is a rising environmental consciousness in the LDCs. This is reflected in requests being received by AID and EPA for assistance in solving environmental problems, creating new environmental institutions, and developing regulatory legislation. Concurrently, the demand for environmental training is increasing. While such training is essential for filling manpower requirements, in the first instance it helps to create a climate within countries in which the environmental aspects of development projects can be addressed more rationally and effectively. In addition, in the process of developing and implementing a training program, an institutional resource is created on which AID can draw for environmental consultants, advisors and studies.

Finally, environmental training programs offer a particularly good opportunity to further the multilateral approach to development assistance. Informal talks with the World Bank and the OAS indicate that they may be interested in joining with AID and UNIDO in any future ventures.

Consequently, when one considers environmental training within the broad context of evolving development assistance needs, the evaluation team is inclined to think that there should continue to be a place for such training within AID priorities. Although the value of such programs is not immediately measurable, benefits should increase over the longer run as more planners comprehend the need and means for incorporating environmental considerations into project design.

And the benefit/cost ratio would be enhanced if, as proposed, future training programs are designed for subsequent export and replication overseas.

The evaluation team believes that future AID planning with respect to environmental training should seek to establish a course sufficiently attractive to be sustained by the implementing institution in the absence of AID central funding. /1 In addition, it should lend itself to propagating other training courses overseas. The latter might be either regional or national in nature, utilize a small U.S. team, and rely on "graduates" of the U.S. course to participate in the organization and implementation. The final stage should find LDC institutions conducting the training without AID support. This "spin-off" technique has been used sparingly to date, has been successful where designed properly, and should come into more frequent use as a technical assistance instrument.

Specifically, the evaluation team RECOMMENDS THAT:

1. AID should continue to support an environmental training program for senior policy makers from developing countries. The "environment" is a world problem, not just one for the industrialized nations, and the pilot project demonstrated that U.S. environmental laws, institutions and experiences are of interest to LDC personnel and can have relevance for their problems. Since other U.S. agencies cannot legally finance LDC training, AID should continue to lead this field.

/1 See Appendix A for a description of the type of training course the evaluation team believes best suits the needs of LDC policy makers.

2. The main objective of future courses should be to give policy makers an understanding of: (a) the reasons why environmental considerations must be tied into development planning; and (b) how they can set policies, establish legislation, assess costs and benefits, evaluate alternative pollution control options, and organize for environmental action (see Appendix A).

3. Participants should be planners and policy makers from planning commissions, economic development ministries, ministries of finance, or similar bodies with developmental and planning functions. Also, upper rank members of public works, health, agricultural ministries, agricultural banks, and industrial development corporations may be included. Representatives of established LDC environmental organizations who ostensibly are already motivated, should be given second priority.

Policy level training should not be viewed as a substitute for technician training which, by virtue of its specialization and wide diversification, can best be provided by selecting on an individualized basis from among the variety of excellent courses offered by U.S. technical agencies, private firms and academic institutions.

4. If possible, based on considerations of desired class size and number of qualified nominees, participants should be selected in 2 or 3 man teams to reinforce each other and create more impact after their return home.

5. The purpose, objectives and target audience should be specifically and fully described in announcing the course to the field, and identical announcements should be sent by the various sponsoring institutions.

6. Selection of participants should be based on, among others, active involvement of overseas missions. This might be facilitated by transmittal of hand-tailored messages to selected missions where the country situation and local institutions are well known, requesting specific individuals to handle the recruitment.

7. Course content should include consideration of environmental policies, legislation, organization, economics, and technological options for dealing with problems. It should be non-technical in nature which would make it possible to consider policy issues as they relate to agriculture, transportation and other major developmental areas as well as those of special significance for industry. Since the course would no longer be focused on the industrial sector, UNIDO's participation might be affected.

9. The case study approach should be adopted as a principal instructional method since it provides a mechanism for integrating and presenting the diverse components of environmental planning (e.g., regulations, organization, policies) in a development-oriented context. Typical case studies might include the siting of power plants and industries, dredging and filling of wetlands for urban development, and road and airport construction. Emphasis should be placed on the potential economic losses and human health effects associated with failure to consider the secondary environmental consequences of such development activities. Both the U.S. and LDC cases could be utilized, and particularly some of the more controversial and publicized projects for which significant environmental analyses have been carried out and documented.

9. The course design should aim at an operational (rather than academic) approach, and employ a seminar format that would emphasize discussion methods.

10. Field trips should be carefully chosen to relate directly to the classroom sessions, and possibly organized around the case studies. Regardless, the experiences should be meaningful and relevant to an LDC audience, and the overall program designed to minimize travel time.

11. To increase opportunities to attract senior personnel from the developing countries, future courses should be no longer than 8 weeks in duration. Six weeks may be optimal.

12. Program planning and design should aim at creating a coordinated, integrated training packet (which might include pre-departure preparation of a paper on LDC environmental problems or a case study for use during classroom discussions, and post-course follow-up activities to sustain and reinforce the training).

13. A well-defined follow-up program should be designed which, among others, might include provision for periodic distribution to the trainees of environmental literature and visual aids through a mailing list and, on occasion, personal contact by representatives of the sponsoring agencies.

14. Training materials, including documents, slides and audio tapes should be prepared during the course for distribution to the LDCs via the participants and also to overseas missions and other interested institutions.

15. The course should be designed so that upon completion, "spin-off" training seminars can be conducted in selected LDCs, utilizing both materials developed during the basic course and also some of the participants who would take the lead in organizing and managing the seminars.

16. The contractor should appoint a full-time senior program director who would coordinate and monitor all substantive aspects of the program, as well as functioning as the senior leader, leaving administrative details to backup personnel.

17. Program administration within AID should be handled by the Office of International Training.

18. In addition to UNIDO, other multilateral and regional development institutions such as the World Bank, WHO, FAO, UN Environmental Program, and OAS should be invited to participate in sponsoring the course and cooperating in related follow-up activities.

19. A new PROP should be prepared by the Office of Science and Technology, TAB, that would provide for a continuation of the international environmental training program along the lines described in the preceeding recommendations. Funding should be adequate for two more sessions of the training course, plus 2-3 overseas seminars. A lesser commitment than two sessions would undoubtedly diminish the caliber of the effort the contractor is willing to make. Design criteria for future training courses should include creation of a program sufficiently attractive and flexible to stimulate

the contractor institution, particularly if a university, to continue to include the program within its regular curriculum (both for LDC and American students) after two more courses when AID central funding is no longer available.

20. Selection of a contractor should be based on solicitation by AID of proposals from a number of pre-selected institutions. Potential contractors include a variety of academic and private institutions with ongoing environmental programs which have professed an interest in providing training programs for developing countries. However, regardless of the choice, the contracting institution would be expected to reach outside its own staff to draw on personnel from other institutions due to our belief that no single institution has, at present, the broad base of experience and talent necessary to provide a comprehensive environmental training course relevant to unique LDC needs.

Appendix A

A Future Environmental Training Program

The following provides a philosophical framework within which future AID-sponsored environmental training programs for LDC policy makers should be considered and designed, and also contains specific suggestions for the composition of any future training courses.

Premise: We are not going to advance the cause of either environmental protection or economic development appreciably if we view the environment in the narrow sense -- as separate from and only marginally related to development. We should instead view environmental considerations in the same broad sense as did the development economists who wrote the Founex Report.*

They pointed out that while the economically advanced countries see development as a cause of environmental degradation, the developing countries see it as essentially a cure for their major environmental problems which stem from poverty, poor water, housing, sanitation, nutrition, and disease. The concern for the environment therefore, must not detract from development, but should instead reinforce our commitment to improve the overall quality of peoples' lives.

This environmental concern can, in fact, serve to provide new dimensions to the development concept itself, by making environmental issues a part of the new broader economic - social - cultural goals of integrated development.

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* A report on Development and Environment prepared in Founex, Switzerland, June 1971, to highlight issues prior to the U.N. Conference on the Human Environment.

The incorporation of environmental perspectives and policies raises important issues for planning and decision making. In some cases, these objectives support economic growth; in others they conflict. In the latter cases, they mean choices and "tradeoffs" which can only be made by the countries themselves in light of their understanding of environmental problems and the means of finding solutions.

Agricultural growth involves, among others, increased use of water, fertilizers and pesticides; water diversions, often on a large-scale; and changes in traditional social and cultural patterns. Industrialization usually results in release of pollutants to both the air and water. Transportation and communications systems preempt other uses of land, and can disrupt fragile ecosystems. Urbanization creates problems of impaired water quality, air pollution, solid waste disposal, and social problems common to those in the more advanced nations. In the absence of logical and firm actions, secondary environmental problems associated with pursuit of development objectives will swell and further aggravate human, social and political tensions.

To the extent that some of the environmental consequences of development can be avoided by better planning and regulation, the developing countries can profit from the experience of the advanced countries. This requires, however, a thorough analysis of the origin, nature and evolution of present-day environmental problems, and the subsequent establishment of safeguards and standards for future project planning.

Perhaps it is not unfair to say that(at least within the development community) thinking with respect to the meaning and proper mode of "development" is in the middle of a Copernican revolution. Whereas, until quite recently, we were thinking purely in production terms --

in GNP per capita -- we are now publicly admitting that employment, income distribution, and environmental protection are integral components of the development process and that without a proper concern for them, the latter cannot truly prosper. "Development" is coming more and more to be viewed in terms of "quality of life" objectives.

However, despite the increasing awareness displayed as a result of the Stockholm Conference, most LDC governments still consider environmental protection a luxury; a problem of the industrialized countries; another disease of the rich and something which they need not yet give much thought to. Consequently, well-designed short courses for LDC policy makers have been advocated by a number of experts as a useful mechanism for stimulating and equipping the LDCs to make rational decisions on environmental problems, based on a realization that these decisions and problems lie at the very heart of the development process. If this broadened perspective can be achieved, then such courses will be very worthwhile investments.

Some of the topics that a revised environmental training course for LDC policy makers should address are shown below. The actual program would, of course, be worked out by the contractor in close consultation with AID.

Content of an Illustrative Program

1. Legal and organizational:
   a. Evolution of environmental concern and programs in the U.S. and their impacts on society.
   b. Legislation - National Environmental Policy Act, etc.,
   c. Organization, administration and functions of Federal institutions (CEQ, EPA); state environmental departments and programs; local and private environmental organizations and programs.
   d. Regulatory (establishment of criteria and standards, impact statements).
   e. Visits to Congressional Committees, CEQ and EPA.
2. Relationship of environment to development:
   a. International environmental issues - (Impact on trade, industry, foreign aid, social and political constraints).
   b. The Founex Report; economic growth vis-a-vis environment.
3. Economics of environmental safeguards:
   a. Costs/benefits associated with broad environmental and developmental planning
   b. Costs of achieving various levels of pollution control (e.g., Environmental safeguards in the industrial, agricultural and transportation sectors):
4. Planning, management and individual study:
   a. Environmental planning and management, environmental audits, monitoring.

b. Individual program of research, and preparation of study, or environmental impact analysis of home country problems (developed before or after arrival).

5. Review -- Environmental policies and decision-making in the developing country context:

Seminar on relating foregoing information to LDC needs -- identifying necessary differences in perspectives, priorities, and approaches. Alternative institutional and legal frameworks would be discussed, along with economic implications of the alternatives.

These various components could be organized around, and related to, a series of carefully selected case studies of actual development projects (for which detailed background information exists on their physical, economic, institutional and social factors). In addition tc the availability of background data, the ideal case study would be one that is interesting and attractive by virtue of its controversial nature, illustrates how a variety of U.S public and private institutions interact, and lends itself to field studies. Through the case study approach, participants would be exposed to the spectrum of physical and social factors to be considered in the decision-making process (e.g., air and water quality aspects; roles of federal, state, local jurisdictions and conservation groups; economic cost/benefits; technological options). Besides a field trip component, the case studies should involve participation by federal, state and private experts familiar with the projects. Candidate studies include Seneca Dam; TVA river

basin development; Miami jetport; Maryland wetlands dredge and fill; siting of an industrial complex or individual plant; and highway construction.

APPENDIX B

AID AND UNIDO PROGRAM ANNOUNCEMENTS

TELEGRAM **DEPARTMENT OF STATE**

UNCLASSIFIED
CLASSIFICATION

088133
1822527-1174

SEND TO- AID CIRCULAR AIDE

FOR COMM. CENTER USE ONLY

AIDAC

Customer for [illegible]
Bangkok [illegible]

SUBJECT- Demonstration Environmental Training Course

REFERENCE-

FOR MISSION DIRECTORS FROM J. Fowler A/AID

1. AID/W considering funding in collaboration with UNIDO 11-week demonstration training course at University of North Carolina, January 20-March 8,1973, on environmental aspects of industrialization. Focus would be on identification and assessment problems associated industrial location and plant processes; nature and costs of air, water and solid waste pollution control; and legal/institutional aspects. First half of course devoted classroom instruction and remainder to visits variety of industrial plants in southeastern U.S. Each participant assigned to one plant during last week for in-depth

DRAFTED BY	OFFICE	PHONE NO.	DATE	APPROVED BY
Bill L. Long:ah	TA/OST	22418	5-16-72	A/AID, James Fowler

AID AND OTHER CLEARANCES
ASIA/T ECH,JDalton (subs.)
SA/IR, FLyvers (subs)
SER/IT,WVogelsang (subs)
SER/ENGR,LHale (subs)
AFR/TAC,JBlumgart (subs)
DS/OD,JChamberlayne(subs)
AFR/DP,EDonoghue
AA/LA,MParris LHarrison (phone)
INFO: PPC, JKaufmann

UNCLASSIFIED

PAGE 1 OF 2 PAGES

35

TELEGRAM **DEPARTMENT OF STATE** 088133 CONTINUATION

NO.	CLASSIFICATION	PAGE	PAGES
AID CIRCULAR	UNCLASSIFIED	2 OF	2

analysis. This first-of-a-kind course would be thoroughly documented and evaluated to serve as the basis for determining character and relevance future AID training environmental field.

2. Contemplating central-funded AID support of approximately 20 LDC participants for initial demonstration course. Desired audience includes second-level policy planners and managers from ministries and government agencies involved in industrialization decision-making; sub-directors industrial research institutes; key educators involved in industrial training.

3. Would appreciate Mission inquiry appropriate host country officials to appraise demand for course. If possible request preliminary estimate of number and type host country participants who might be nominated if PROP approved and invitation extended to submit formal nominations. Also request Mission opinion on ability to attract top participants given following alternatives: (a) total funding provided AID/W under central contract; (b) internation travel component covered by host country.

4. Given need to make prompt decision on FY 72 funding, would appreciate Mission response by May 30.

Cable Room; SEND TO LIST P

DATE SENT

FROM -

SUBJECT - Demonstration Environmental Training Course

REFERENCE - AID CA-88133

1. AID/W has now signed a contract with the University of North Carolina (AID/csd-3680 for the 11-week demonstration training course on the environmental aspects of industrialization. The qourse is centrally-funded by the Office of Science and Technology (TAB) as a test and demonstration of U.S. capabilities for synthesizing and presenting to key developing country officials relevant information on the causes of, and alternative solutions to, environmental problems associated with industrial development activities. The course combines classroom instruction with field visitations and studies at a large number of U.S. industrial plants which are carrying out operations similar to those encountered in developing nations.

2. The course is designed for a maximum of 30 participants, 20 of whom will be supported by AID. UNIDO will support the remaining ten. In view of the large number of Missions which responded positively to the request in the referenced airgram for an expression of country interest, and our

Enclosures: (1) Application Forms; (2) Course Announcement

PAGE 1 OF PAGES 3

DRAFTED BY	OFFICE	PHONE NO.	DATE	APPROVED BY:
Bill L. Long	TA/OST	22418	8/3/72	TA/OST:G. E. Schweitzer

AID AND OTHER CLEARANCES

A/AID-J.Fowler ASIA/TECH-R.Johnson SER/IT-W.Fuller SER/ENG-W.Mann
AFR/DP-E.Donoghue TA/PM-F.Correl UNCLASSIFIED SA/IR-F.Lyvers
AA/LA-L.Harrison DS/OD-J.Chamberlayne

CLASSIFICATION

AID-0-33 (11-68)

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PRINTED 8-68

desire for a broad geographic representation in the initial course, it appears unlikely that more than 1-2 candidates can be selected from any one country. However, since the anticipated demand may not materialize in some countries, and because it may be possible to increase the number of openings, we suggest that countries be encouraged to submit up to four nominations in order of priority.

3. Enclosed are application forms and course announcements for distribution to appropriate institutions. We are seeking participants who are, or will shortly be, in positions to translate new knowledge into industrial policies and management decisions in their countries (e.g., second level planners and managers from ministries and government agencies involved in industrialization; key educators in industrial training fields; and top personnel from industrial research institutes). AID/W will make the final selection of participants in consultation with the University of North Carolina, but we would welcome Mission recommendations. Consequently we are requesting applicants to return completed forms to the AID Mission by October 1, 1972, for subsequent review by the Mission and then batch transmittal to AID/W by October 15. Announcement of selected candidates will be made by November 15.

4. In response to a question raised in Ref. airgram, a number of Missions indicated that the host country is willing to pay international travel costs for their participants. We want to encourage this and consequently have not indicated in the announcement that AID is prepared to finance international travel. However, we recognize that other countries are not willing to provide such funds based on their lesser concern with

environmental training. Since a broad geographical representation would have mutual benefits, we are prepared to cover international travel for top candidates in countries which could profit from training experience and which have suitable candidates, but which will not otherwise participate. Consequently, we request Missions to initially test the demand for the course if the host country must pay international travel and then, at the Mission's discretion, to indicate the possibility of total support (including international travel) if at last one top candidate from the country does not otherwise make application. First priority in the selection process will be given to candidates who will not require funds for international travel, but it is anticipated that many countries will not be represented if they must provide these funds. Missions can indicate funding requirements for each candidate on the completed application forms to be transmitted to AID/W.

5. UNIDO has indicated its intention to support up to 10 participants and announcements to this effect will probably be distributed through UNIDO channels in the near future.

DISTRIBUTION (TO FOLLOWING MISSIONS)

AFRICA

Zaire
Ghana
Kenya
Liberia
Swaiziland
Tanzania
Uganda
Tunisia

ASIA

Burma
India
Indonesia
Korea
Nepal
Philippines
Thailand
Turkey
Bangladesh

Latin America

Brazil
Argentina
Bolivia
Chile
Ecuador
Guatemala
Honduras
Nicaragua
Panama
Paraguay
Peru
Uraguay

APPLICATION FOR ADMISSION

International Program in Environmental Aspects of Industrial Development
Department of Environmental Sciences and Engineering
School of Public Health, University of North Carolina
Chapel Hill, N.C. 27514
Attn: Ms. Charlotte E. Hermann, Program Coordinator

1. Name in Full: .....
(UNDERLINE THE NAME BY WHICH YOU ARE OFFICIALLY ADDRESSED)

2. Date of Birth: Month .....; Day .....; Year .....

3. Place of Birth: ..... 4. Country of Citizenship .....

5. Home Address: .....

..... Telephone: .....

6. Marital Status: Single .....; Married .....; (No. of children: .....)

7. College or University Education:

Institution	Address	Degree Award and Date
.....	.....	.....
.....	.....	.....

8. Experience Record (List most recent employment first):

A. Position: _____ Dates: _____

Name and Address of Employer: .....

Brief job description: .....

.....

.....

.....

.....

B. Position: ..... Dates: .....

Name and Address of Employer: .....

.....

Job Description: .....

.....

9. Description of Particular Field(s) of Interest: .....

.....

10. Applicant's Description of English Proficiency:

Reading Ability: Excellent .....; Good .....; Fair .....; Poor .....

Writing Ability: Excellent .....; Good .....; Fair .....; Poor .....

Speaking Ability: Excellent .....; Good .....; Fair .....; Poor .....

11. Sponsorship: I have contacted the following in regard to financial sponsorship:

U.S. Agency for International Development .....; United Nations Industrial Development Organization .....[redacted]

[redacted]

12. Dependents to Accompany You, if Any: .....

13. Names and Addresses of Persons (2) to be Contacted as References, in the Event References are Needed: .....

.....

.....

14. Additional Information Required (please attach):

Photograph.

[redacted]

A written statement concerning what you hope to achieve from your training in the U.S.

15. Comments and/or Additional Information: .....

.....

.....

DATE: ..... APPLICANT'S SIGNATURE .....

ANNOUNCING AN

International Training Program On the Environmental Aspects Of Industrial Development (IPAID)

January - April 1973

University of North Carolina, Chapel Hill, North Carolina, USA

UNDER THE JOINT SPONSORSHIP OF:

Department of Environmental Sciences and Engineering
School of Public Health
University of North Carolina, Chapel Hill

United States Department of State
Agency for International Development

United Nations Industrial Development Organization

****

COURSE DESCRIPTION

The purpose of the course is to train senior personnel from developing countries in the identification and analysis of, and alternative solutions to, environmental problems associated with the siting and operation of industrial plants. The area of instruction will cover the impacts of industrial development on the environment and will include: (1) the impact of the facility or development on the community and region in which it is located or to be located, its air, water, soil and people; and (2) the impact of the product as it is used, and ultimately disposed of, on society. The intent of instruction is to prepare participants to identify and solve these types of environmental problems for both proposed and existing industrial facilities and developments in their parent countries. Upon completion of the program, participants will recieve a full set of resource materials and course documentation. A major component of the course will be a series of field visitations to industrial plants in the U.S. to study the technology, methodologies and policies currently being utilized to build environmental safeguards into industrial operations.

COURSE CALENDAR

January 20-21	Registration and Orientation	Chapel Hill
January 22-March 3	Classroom and Laboratory Instruction	Chapel Hill
March 4-18	Field Instruction at Industrial Facilities	
	Heavy Industry	Florida, Alabama, and Louisiana
	Light Industry	North Carolina, South Carolina, and Georgia
	Mechanical and Electrical Engineering Industries	Tennessee, Kentucky, and Ohio
March 19-25	Intensive Evaluation of Selected (by participant) Industrial Operation	Field
March 26-31	Preparation of Environmental Analyses	Chapel Hill
April 1	Travel to Washington, D.C.	
April 2	Review and Evaluation of Program Washington, D.C.	

ADMISSION REQUIREMENTS

- Active involvement in the planning and/or managerial aspects of industrial development
- An engineering or equivalent degree
- Ability to communicate competently in English
- Acceptable to both University of North Carolina (UNC) and AID as to academic admissibility

ADMISSIONS PROCEDURE

Applications for admission should include the usual biographical data, including information as to present occupation and title, and, where possible, a transcript of college grades. An application form, obtainable from AID Missions, should be used. Application forms should should be completed and returned to the AID Mission by October 1, 1972.

FINANCIAL SUPPORT

For participants admitted to the program, AID will finance:

- Field travel in USA required by program
- Subsistence - Housing and meal allowance
- University tuition and fees
- Book Allowance

HOUSING OF PARTICIPANTS

UNC will arrange housing for participants, two persons to a dormitory room. UNC will assist in arranging, but cannot be responsi for housing or travel of participants families.

SELECTION OF PARTICIPANTS

Course size will be limited to 30 participants, 20 of whom will be selected and financially supported by AID. UNIDO is providing support for ten (10) participants, and application for these awards should be made through UNIDO channels. Priority will be given to senior government officials and educators who are actively involved in industrial planning and management within the framework of their present responsibilities.

PROGRAM DIRECTOR

Professor Richard F. Cole
School of Public Health - Dept. ESE-UNC
University of North Carolina
Chapel Hill, North Carolina 27514
Telephone: (919) 966-2120 or 2129

PROGRAM CONSULTANT

Professor Author C. Stern
School of Public Health - Dept. ESE-UNC
Chapel Hill, North Carolina 27514
Telephone: (919) 966-1370

PROGRAM COORDINATOR

Ms. Charlotte E. Hermann
School of Public Health - Dept. ESE-UNC
Chapel Hill, North Carolina 27514
Telephone: (919) 966-2120 or 2129

****

UNIDO ANNOUNCEMENT

IN-PLANT GROUP TRAINING PROGRAMME ON THE ENVIRONMENTAL ASPECTS OF INDUSTRIAL DEVELOPMENT

Co-sponsored by the United Nations Industrial Development Organization and the Agency for International Development, United States, Department of State, to be held in the USA 22 January to 4 April 1973

AIDE-MEMOIRE

Background and purpose of training

The programme co-sponsored by the United Nations Industrial Development Organization (UNIDO), and organized by the University of North Carolina, is one in a series of UNIDO's in-plant group training programmes for higher industrial personnel from developing countries.

UNIDO has initiated these in-plant group training programmes in industrialized countries and organizes them in co-operation with governmental authorities and industrial enterprises and other organizations who provide the required training facilities and the services of qualified technical personnel.

The basic objective of the programme is to provide the participants, in a relatively short time, with concentrated practical experience and to upgrade their theoretical knowledge in the field of the environmental aspects of industrial development and allied subjects, by giving the participants the possibility to work and study under close and continuous supervision of experienced specialists in these fields.

Programme

The programme will consist of three parts, namely:

A. A programme of classroom and laboratory instruction (approximately six weeks) which will deal with subjects such as:

- Air environment: types of pollutants, their effects, measuring and monitoring.
- Water supply: quality and quantity requirements, monitoring and interrelationship of various uses.
- Liquid waste: its nature, effects and measurements and monitoring of pollutants.
- Solid waste: its disposal and recovery and reuse of valuable materials.
- Effects of Industrial Development on the Community.
- Control Technology for gaseous, liquid and solid wastes.
- Organization for environmental control: legislation, regulations and standards.
- Preparation of Environmental Audits.

This part of the training programme will be common to all participants. The objective of this part of the programme is to provide the participants with a comprehensive knowledge of techniques and methods used in environmental control. It is intended to prepare the participants for the field instruction, when techniques and methods of control are studied in specific industries.

B. Field instruction:

The field instruction will have a duration of approximately three weeks.

During the first two weeks the group of participants will be split into three groups; each group will study industries to their own field of interest.

The following groups are envisaged, but could be altered depending on the ultimate composition of the group of participants.

- Heavy industry group concentrating on environmental problems of steel, aluminium, cement, fertilizer and pulp industries and petroleum refineries.
- Light industry group concentrating on environmental problems of the textile, furniture, brick and food processing industries.
- Engineering group concentrating on environmental problems of industrial, agricultural and domestic equipment manufacturing industries and power plants.

Each group will visit a number of plants, the environmental regulatory agencies (state and city) and the office of an engineering organization specializing in environmental problems.

During the third week each participant would be assigned to one of the plants and organizations visited. The aim of the study is that each participant will make an in-depth study of the environmental problems and their solutions of that plant or of a proposed new plant of current concern to the organization. These assignments, so far as possible will be made to meet the individual interest of each participant.

The nominees are requested to indicate clearly in which of the three groups they want to be placed as well as their specific interest for the individual one week study. The programme management will take into account any priority listing given by the nominees but cannot guarantee that it could comply with all individual wishes.

C. Final session

The last 1½ week will be reserved for the preparation, under supervision and guidance, of a final report on the field instruction as well as review and evaluation of the programme.

Date and Place

The programme will be held from Monday, 22 January 1973, through Wednesday, 4 April 1973. Participants are expected to leave their home countries in time to arrive in the Chapel Hill, North Carolina, USA on Saturday, 20 January or, at the latest, Sunday, 21 January 1973.

The theoretical programme to be held at the University of North Carolina, Chapel Hill, USA and will be organized by the Department of Environmental Science and Engineering, School of Public Health of this University. The field instruction will be conducted in different parts of the USA.

Fellowships

Ten fellowships will be awarded by UNIDO to nominees from selected developing countries in Africa, Asia and the Far East, Europe and the Middle East and Latin America. Governments are asked to nominate up to three candidates. The Agency for International Development will sponsor twenty fellowship for this training programme.

The candidates should have a university degree in a technical field. They should be employed by Government authorities or industrial research institutions or industrial enterprise or corporation in their home countries at a sufficiently high level to influence industrialization policies of the country. Persons without a university degree could be considered for participation provided their practical experience and their position indicate that they are able to follow the programme.

The training programme is not bound to any specific sector of industry, as environmental control is considered a field of its own and applicable to any kind or sector of industry.

UNIDO will, in co-operation with the programme director, select fellows from among the nominations received, giving due regard to professional qualifications, level of experience and other relevant considerations.

Participants will attend the programme in an individual capacity although they have been officially nominated by their respective Governments. They undertake to attend the whole of the training programme according to the rules and regulations laid down for their training and the schedule prepared by the host authorities.

Language requirements

The programme will be conducted in English. Consequently a very good command of the English language is absolutely necessary. Applicatns from non-English speaking countries will have to take a language test and to submit a satisfactory language certificate before being considered eligible for a fellowship.

Financial and administrative arrangements

Financial and administrative arrangements for the fellowship holders will be as follows:

1. UNIDO will provide the funds to cover:

   a) Round-trip economy class air transportation between the airport of departure in the home country and the airport in the USA (.....) in accordance with the existing arrangements between the United Nations and the country receiving technical assistance.

   b) Board and lodging during the training period.

   c) An educational allowance for books and an allowance for out-of-pocket expenses.

   d) Training cost of the programme.

   e) Internal travel related to the training programme.

2. The fellow's Government will be required to bear the following costs:

   a) All expenses in the home country incidental to travel abroad, including expenditures for passports, medical examinations, inoculations and other such miscellaneous items as well as internal travel to and from the airport of departure in the home country.

   b) Salary and other benefits for the fellows during the period of the training programme.

Neither the sponsors of the training programme nor the United Nations will assume responsibility for the following expenditures:

a) Costs incurred by fellows with respect to travel insurance.

b) Compensation in the event of death or disability of fellows in connexion with their attending the training programme.

c) Loss of or damage to personal property of fellows while attending the training programme.

d) Purchase of personal belongings and compensation for damage caused by climatic or other conditions.

e) Travel or any other costs incurred by dependants who might accompany or visit the fellows during the training period.

NOTE: Participants will note that:

No facilities for the accommodation of dependants are available as the University of North Carolina will arrange housing for the participants, two persons to a dormitory room. Participants are thus strongly advised NOT TO HAVE MEMBERS OF THEIR FAMILY ACCOMPANY THEM.

APPENDIX C

CLASSROOM AND FIELD TRIP PROGRAMS

NOTE: This material has been excerpted from the final report of the University of North Carolina which bears full responsiblity for all "comments" and annotations.

An annotated classroom schedule is included below. The lecturer's professional affiliation, an explanation of the topic discussed in the morning session, and an explanation of afternoon activities is included.

CLASSROOM SCHEDULE

	Date and Lecturer	Sessions
1.	1-22-73 Provost Morrow, Dean Harper, Dr. Okun, Dr. Hinote, Mr. Long, Prof. Stern, Mr. Leak	Introduction and Welcome. Mr. Leak discussed "Industrialization in the South," paralleling its recent industrialization problems to many problems in the developing countries.
2.	1-23-73 Dr. D. A. Okun, Head, Dept. ESE, School of Public Health, UNC-CH	Morning: "Water & Industrial Development." Discussed sources & quality requirements of water for industrial use & the importance of controlling and monitoring industrial wastes to prevent contamination of potable water sources. Afternoon: Discussion of same topic.
3.	1-24-73 Prof. Emil Chanlett, Prof. of Radiation, Dept. ESE	Morning: "The Environmental Problem." Introduced concept of expotential growth of populations, power, resource use, & pollution vis-a-vis assimilative capacity & natural constraints of the physical environment. Afternoon: Discussion of same topic.
4.	1-25-73 Dr. D. A. Okun, Head, Dept. ESE School of Public Health, UNC-CH	Morning: "Planning for Water Management Projects." Discussed the criteria that should form the basis for decisions on the extent of mechanization & automation to be incorporated

	Date and Lecturer	Sessions
	1-25-73	into design systems for water and wastewater treatment plants.
5.	1-26-73 Dr. Don Francisco, Assistant Director of UNC Wastewater Research Center, and Dr. Linda Little, Associate Professor of Environmental Biology, Dept. ESE	Afternoon: Discussion of same topic. Morning: "Nature of Water Pollution." Introduced concepts and definitions of pollution, ecological diversity, and the potential of wastewater treatment plants to handle different industrial pollutants. Afternoon: Field trip to UNC Wastewater Research Center. Good tour of laboratory facilities and demonstration of pilot plant projects. Discussion of current research being conducted at the Center.
6.	1-29-73 Dr. Don Francisco and Dr. Linda Little	Morning: "Effects of Pollutants on Life." Discussion of effects of different industrial wastes such as oxygen demanding materials, and lake nutrients on aquatic flora and fauna and methods used in their control. Afternoon: Field Trip. Good tour of laboratory facilities and monitoring and chemical dosing procedures at Chapel Hill Water Plant.
7.	1-30-73 Prof. George Barnes, Prof. Emeritus of Environmental Engineering, Dept. ESE	Morning: "Industrial Waste Surveys." Discussion of general kinds of industrial wastes and their contaminating effects: identifying industrial wastes, and some specific cases of industrial problems & remedial measures and costs. Afternoon: Discussion of same topic.
8.	1-31-73 Prof. George Barnes	Morning: "Measurement/monitoring of Pollutants. Discussion of instrumentation used in monitoring industrial wastes and approaches to organizing industrial waste monitoring program. Afternoon: Discussion of same topic.
9.	2-1-73 Dr. Robert Baker, Teledyne-Brown Consulting Engineers, Huntsville, Alabama	Morning: "Trace Organic Contaminants." Introduce etiology of taste and dor problems in water supplies in developing countries, techniques used to detect contaminants & approaches to eliminating contaminants. Afternoon: Discussion of same topic.

	Date and Lecturer	Sessions
10.	2-2-73 Dr. Paul Busch, Malcolm Pirnie Consulting Engineers, White Plains, N. Y.	Morning: "Control Technology for Industrial Water/Wastewater." Presentation of advanced treatment process alternatives for industrial wastes with recommendation on planning, cost, and sophistication level suitable for different situations. Afternoon: Discussion of same topic.
11.	2-5-73 Prof. A. C. Stern, Professor of Air Hygiene, UNC-CH	Morning: "Introduction: Air Environment, Air Pollutants." Discussion of elementary terms and sources of bibliographic information concerning air pollution and industry. Afternoon: Discussion of same topic.
12.	2-6-73 Mr. Carl Zeller, Air Quality Division of Meteorology, NERC, EPA, N. C.	Morning: "Transport & Diffusion of Pollutants." Discussion of role of meteorology as the link between sources and receptors in the air pollution cycle and examples of elementary diffusion problems from industrial sources with implication to industrial siting and zoning. Afternoon: Discussion of same topic.
13.	2-7-73 Prof. Lyman Ripperton, Prof. of Air Hygiene, ESE, and Dr. Jean French, Research in Epidemiology, Division of Human Studies, NERC, EPA, N. C.	Morning: "Effects of Air Pollutants on Life (Plants, Animals, Humans) and on Property." Discussion of short term and long term effects of specific air pollutants on different life forms, approaches to doing research in this area, and implications for industrial zoning and pollution control. Afternoon: Discussion of same topic.
14.	2-8-73 Dr. Harvey Jefferies, Assistant Professor of Air Hygiene, ESE	Morning: "Measurement/Monitoring of Air Pollutants." Discussion of instruments cost and use in measureing specific gaseous and particulate air pollutants, and approaches for setting up a monitoring system for stationary and mobile sources. Afternoon: Field Trip. Very good tour of Durham, N. C. Wastewater Research Plant. Discussion of industrial wastes present in plant influent, requirements for industries to "pre-treat" wastes, and tax surcharges on industrial wastes discharged to the Durham City Plant. Tour of laboratory facilities.

	Date and Lecturer	Session
15.	2-9-73 Mr. Dave Hemenway, Ph.D. candidate, ESE	Morning: "Control Technology for Particulate Air Pollutants." Discussion of the instrumentation cost and use in particulate control, using examples of specific industries. Afternoon: Discussion of same topic.
16.	2-12-73 Mr. Joe Sickles, Air Quality Division of Meteorology, NERC, EPA, N. C.	Morning: "Control Technology for Gaseous Air Pollutants." Discussion of magnitude of the problem in industry and the general techniques for controlling emissions (absorption, condensation, combustion, adsorption), costs, and applications in U.S. industries. Afternoon: Field Trip. NERC, EPA, N. C. Cursory tour of facilities and discussion of EPA functions and activities, industrial survey procedures, special air quality studies, and economic impact of pollution control. Although topics covered were pertinent, aft. session was not enough time for adequate coverage.
17.	2-13-73 Prof. John Cassel, Head, Dept. of Epidemiology, School of Public Health, UNC-CH Mr. Tom Alspaugh, Water & Air Resources, Cone Mills Corp., Greensboro, N. C.	Morning: "Effects of Industrial Development on Community Health." Discussion of short term epidemiological studies in U.S. of effects of specific industrial effluents on communities, and the health effects of mass migration to urban areas in industrializing areas. Afternoon: "Environmental Problems of the Textile Industry." Discussion of state and federal effluent standards for the textile industry, the costs and difficulties of installing pollution control equipment in an old plant.
18.	2-14-73	Morning: Field Trip. Schlitz Brewery, Winston-Salem, N. C. A cursory tour of the brewery processing techniques with minor emphasis on pollution control problems and technology used to control effluents. Afternoon: Continuation of Field Trip.

	Date and Lecturer	Sessions
19.	2-15-73 Dr. William Mierovk, Director, Regional Research Institute, University of West Virginia	Morning: "Effects of Industrial Development on Community Noise, Transportation, School Systems, Recreational Facilities, etc." Afternoon: Discussion of same topic.
20.	2-16-73 Dr. Aarne Vesilind, Assistant Prof. of Civil Engineering, Duke University	Morning: "Solid Waste: Disposal & Recycling (Recovery & Reuse)." Afternoon: Field Trip: IBM, Research Triangle Park, N. C. Cursory tour of plant where parts for computors and typewriters are assembled, followed by short discussion of IBM's environmental programs and standards that must be met. The program, in general, was too superficial.
21.	2-17-73	Morning: Field Trip: Wrightsville Beach Test Facilities, Desalting Plant, Wrightsville Beach, N. C. Discussion of newest technological processes and alternatives to desalting ocean and brakish water, and costs involved, followed by tour of facilities. Tour was quite satisfactory. Afternoon: Continuation of Field Trip.
22.	2-19-73 Dr. David Fraser, Prof. of Industrial Hygiene, ESE	Morning: "Introduction: Occupational Health." History of occupational health in U. S. industries and the implications of present national legislation to U.S. industries' health programs, with several specific examples. Afternoon: Case Study of United Glass Limited, the decisions facing the corporate management concerning the need for plant improvements in the area of occupational safety in a very old factory.
23.	2-20-73 Prof. Benjamin Ferris, Prof. of Environ. Health & Safety, Harvard School of Public Health	Morning: "Standards for Plant Environment." Discussion of present threshold limit values for industry approaches to the prevention of occupational disease through control of airborne toxic substances. Afternoon: Case Study of United Glass Limited continued.

	Date and Lecturer	Sessions
	Dr. Raimi Ola Ojikutu, Woodrow Wilson Scholar, Smithsonian Institute	Evening: "Focus on the Human Environment in Africa." Discussion of the need for regional cooperation on the problems of the human environment in Africa, specifically addressed to environmental standards and management and protection.
24.	2-21-73 Mr. Grover Wrenn, Industrial Hygienist, ESE	Morning: "Sampling Methods." General analytical approaches for identifying, sampling and controlling toxic substances with many examples included.
	Prof. Curtis McLaughlin, Assoc. Prof., School of Business Administration, UNC-CH	Afternoon: "Business and Industry." The role of the professional in influencing more environmental awareness in his industry and government.
25.	2-22-73 Prof. William Burgess, Prof. of Environ. Health Sciences, Harvard School of Public Health	Morning: "Control Methods." Discussion of alternative approaches and costs of control methods in example industries. Afternoon: Case Study of United Glass Limited continues.
26.	2-23-73 Dr. Leonard Goldwater, Prof. of Industrial Hygiene, Duke Univ.	Morning: "Model Industrial Hygiene Program." Introduction of principles of industrial toxicology, basic terminology, acute and chronic effects, and the role of WHO in developing countries undergoing industrialization. Afternoon: Case Study of United Glass Limited concluded.
27.	2-24-73	Field Trip: Texas Gulf Industry, Aurora, N. C. Discussion by environmental staff of the air, water, and solid waste problems in the phosphate mining industry, technological control alternatives and cost investment required to meet federal standards. Tour of mining facilities and sulphuric and phosphoric acid plants. Excellent program.
28.	2-26-73 Prof. Milton Heath, Assistant Director, N. C. Institute of Government	Morning: "Environmental Legislation, Regulations, and Standards." Introduction of basic legal terminology and judicial system in the U. S. illustrated with environmentally oriented examples. Discussion of the Federal Water Pollution Control Act amendments of 1972 and the Clean Air Act published in 1970.

	Date and Lecturer	Sessions
	Dr. Gene Zeltmann, Environmental Planning, Gas-Turbine Division, General Electric, N. Y.	Afternoon: "Environmental Problems in General Electric." Discussion of standards affecting General Electric concerning emission control, the attitudes of the industry towards considering environmental factors, and the changes in design and location of power plants to meet new standards.
	Dr. Mike Foster, Director Division of Navigation Development and Regional Studies, TVA	Evening: "Environmental Considerations in Industrial Siting." Discussion of how industry is being selected and sited in TVA's Timberlake project and the environmental planning for the Harriman-Rockwood Corridor, another TVA project.
29.	2-27-73	Morning: "Environmental Audits." Emphasis on organizing a program to evaluate all environmental considerations in industrial programs and developing a comprehensive environmental impact statement.
	Prof. Eugene McJunkin, Assistant Prof. in Environ. Engineering, ESE	
	Prof. Curtis McLaughlin	Afternoon: "Business & Industry." Continuation of discussion of the role of the professional in influencing environmental awareness in his industry and government.
30.	2-28-73	Morning: "The Council on Environmental Quality and the National Environmental Protectic Act." Discussion of the origin and functions of the CEQ and the role of CEQ and EPA as relates to NEPA.
	Colonel Trayers, Senior Staff Member, Council on Environmental Quality	
31.	3-1-73	Morning: "Administrative, Legal, & Organizational Development." Dr. Okun discussed the topic using England as a case study. Dr. Schueneman discussed the topic using Air Pollution Control in the U. S. as a case study.
	Dr. D. A. Okun Dr. Jean Schueneman, Director, Control Programs Development Div., NERC, EPA. N. C.	
32.	3-2-73	Morning: "Industrial Development for the Environmental Field." Discussed the necessity for a multidisciplinary approach of a consulting engineering firm in environmental impact analysis.
	Mr. James Fitzpatrick, President, Environmental Analysts, Inc., N Y.	

APPENDIX V : Field Itinerary

for Each Industry Group

Heavy Industry

Date	Visit	Comments
3-5-73	Department of Pollution Control, Tallahassee, Fla.	Discussion of the role of the Dept. in monitoring and enforcing federal and state standards and demonstration of data storage and retrieval system. Good program aimed at environmental planners.
3-6-73	St. Joe Paper Co. Port St. Joe, Fla.	Discussion of environmental problems in the paper industry, cost of pollution control, attitude of industry toward environmental concerns. Tour of plant emphasizing pollution control equipment and tour of joint city-industry waste treatment plant. Qualified staff available for good discussion
3-7-73	Wellman Power Gas, Inc. Lakeland, Florida	Slide presentation of the activities of the consulting engineering firms followed by description of alternative control designs and costs emphasizing air emission control. Very good program aimed at planners with technical backgrounds
3-8-73	Farmland Industries Bartow, Fla.	Discussion by qualified staff concerning the environmental standards and problems facing the fertilizer industry and type and costs of equipment used in that plant. Tour of entire factory including process and pollution control equipment and water treatment systems. Good program for planners.
3-12-73 a.m.	Air Pollution Control Program, Jefferson County Health Dept. Birmingham, Ala.	Discussion of the organization and function of the Health Department and how it relates to other state and federal environmental control agencies. Case studies discussed of environmental crises and solutions in the area. Tour of monitoring stations. Very good program for planners desiring to know general organizational approaches to air pollution control.

Date	Visit	Comments
3-12-73 p.m.	Lone Star Cement Co. Birmingham, Ala.	Thorough discussion by qualified staff of environmental problems, mainly air and industrial hygiene, facing cement industry. Plant did not have pollution control equipment installed, but explained the future program and costs of installation and maintenance in an old plant. Tour followed discussion. Very good example of added costs of installing pollution control technology in a small old plant.
3-13-73	American Cast Iron Co. Birmingham, Ala.	Discussion of air pollution control equipment, costs, and federal standards that must be met. Good example in an industry that has good pollution control systems in water and air installed and functioning.
3-14-73 a.m.	Humble Oil Co. Baton Rouge, La.	Very complex, sophisticated, and costly environmental program making it out of reach of many developing countries. However, very good example of environmental planning in a large industry. Good program for planners.
3-14-73 p.m.	Kaiser Aluminum Co. New Orleans, La.	Very complex, sophisticated, and costly environmental program making it out of reach for many developing countries. Very good and thorough discussion of environmental planning, costs, attitudes toward pollution control and demonstration of problems and control. Good program for planners.

Light Industry

Date	Visit	Comments
3-5-73	Mecklenburg County Health Department Charlotte, N. C.	Discussion of role of the Health Department in environmental surveillance and the different programs of water, air, rodent control, etc. included within the organization. Good program for planners.
3-6-73	Cone Mills Industries Greensboro, N. C.	A variety of topics dealing with textile wastes were discussed and demonstrated, from government regulations to practical application of corrective measures. Excellent visit for the purposes of the program.
3-7-73	Thomasville Furniture Industries Thomasville, N. C.	Discussion and demonstration emphasized, perhaps too much, the dust and SO_x control problems, while too little time was spent on discussion of standards and costs and the over all coordination of environmental problems. Visit would be quite adequate if emphasis were changed slightly.
3-8-73	R. J. Reynolds Tobacco Co. Winston-Salem, N. C.	Thorough discussion and demonstration of environmental standards and control of air quality, liquid waste, occupational health, and solid waste and visit to research and testing laboratories. An excellent visit for the purposes of the program.
3-9-73	Sanford Brick and Tile Sanford, N. C.	Thorough discussion of environmental conservation practices in the areas of energy, water, land, and natural resources. Environmental control technology in air pollution demonstrated and costs discussed. Very good program for purposes of the IPEAID program.
3-12-73	Department of Natural Resources Atlanta, Ga.	Discussion emphasized control of air quality through legislation and technology, and the costs involved. Tour of laboratory monitoring equipment followed discussion. Program was adequate, but perhaps needs more expansion.
3-13-73	Environmental Protection Agency Atlanta, Ga.	Thorough discussion of EPA functions and relationship with other state and local environmental agencies. Discussion of current environmental quality standards. Very good program for planners.

Light Industry Itinerary

Date	Visit	Comments
3-14-73	Fieldale Co. Cornelia, Ga.	Program emphasized poultry processing and occupational safety. Environmental control programs were minimal. Perhaps a plant concerned with other food processes that stressed environmental quality problems would be more adequate.

Mechanical and Electrical Engineering Industry

Date	Visit	Comments
3-5-73	Tennessee Valley Authority, Engineering Office Chattanooga, Tenn.	All day briefing in the Chattanooga offices of TVA by the various bureau chiefs, Mr. G. F. Stone, Assistant Director of Environmental Planning, presiding. Those who spoke were: W. S. Massa, Chief, Maps and Survey Branch; John Lopez, Supervisor, Power Reports and Information Section; C. J. Powell, Supervisor, Environmental Studies Section; O. W. Kocktitzky, Chief Environmental Engineers; George P. Chambers, Environmental Engineering Branch; W. W. Filgo, Environmental Engineer; W. R. Nicholas, Chief, Water Quality Branch; and C. W. Holley, Supervisor.
3-6-73	Raccoon Mountain Steam Power Plant	Briefing on construction and tour.
	Widow's Creek Steam Power Plant	Briefing on facilities and environmental problems, and tour.
3-7-73	Brown's Ferry Nuclear Power Plant	Briefing on construction, facilities, and environmental problems. Tour of plant
3-8-73	River Oaks Building Muscle Shoals, Ala.	Discussion of air quality problems, industrial hygiene program, and tour of the two laboratories and radiological hygiene laboratory.
3-9-73	National Fertilizer Development Center Muscle Shoals, Ala.	Briefings and papers presented by various staff members and tour of facilities and plant. Some of the topics discussed were: "Modern Fertilizer Production Processes"; "Status of Regulations for Air and Water Pollution Control for the Fertilizer Industry and Review of Control Available for Basic Fertilizer Production Processes"; "Fertilizer Runoff-Monitoring Nutrient Losses"; "World Status of Recovery of Sulphur Oxides"; "Use of Waste Heat in Agriculture."
3-12-73	Department of Air Pollution Control Frankfort, Ky.	Briefing on organization and operation of this state agency and Kentucky state air quality regulations.
3-13-73	National Environmental Research Center Cincinnati, Ohio	Briefing by staff of research and activities of the center with a tour of the labs and pilot projects.