

Unesco - UNEP International Environmental Education Programme Analysis Project

A Review of Environmental Education Documents
Numbers 2, 3, 4, 5, 7 and 8

Directed by:

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For:
United Nations Environment Programme
P.O. Box 30552
Nairobi, Kenya
Contract No. 85/0016

UNESCO-UNEP
ENVIRONMENTAL EDUCATION
SERIES ANALYSIS PROJECT.

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1. Dr. Ayman Aquib, Ain Shams University, Cairo, (Egypt)
2. Dr. Michael Atchia, Mauritius Institute of Education Reduit, (Mauritius).
3. Dr. Magnus Cole, University of (Sierra Leone) Njala University College, Freetown (Sierra Leona)
4. Dr. Russel Linke, Australian National University, Canberra, (Australia)
5. Mr. Ian Robottam, Deakin University, Geelong, Victoria (Australia)
6. Dr. Gary Knaimiller, The University of Leeds, Leeds, (United Kingdom)
7. Dr. Reinhold E. Lob, University of Essen, Essen, (Federal Republic of Germany)
8. Dr. Kartikega V. Serabhai, Nehru Foundation for Development, Thaitej Tekra, Ahmebad, (India)
9. Dr. William B. Stapp, University of Michigan, Ann Arbor, Michigan (U.S.A.)

Scope of Project:

The Unesco-UNEP International Environmental Education Programme developed a document series of experimental modules for the pre-service and inservice training of primary school teachers, secondary school science teachers and social studies science teachers in the area of environmental education. This project was designed to evaluate the utility of those modules utilizing a select panel of international experts in environmental education.

Objective

To assess six Unesco-UNEP International Environmental Education modules to determine their usefulness as teaching and instructional aids.

Background

Beginning in the early 1970's various regional and international meetings began to focus on environmental issues. The UNESCO/UNEP environmental education program began in 1974 was followed by the 1975 International Workshop on Environmental Education in Belgrade, Yugoslavia. In 1977, the Intergovernmental Conference on Environmental Education was held in Tbilisi, USSR under sponsorship by Unesco and in cooperation with UNEP. The purpose of the conference was "to formulate recommendations for action which might be undertaken at national, regional and international levels for the promotion and development of environmental education."

The overriding issue at the conference was how to introduce environmental protection of resources while fulfilling human needs. How to best educate concerning other environmental issues was a dominant theme. Environmental education was defined in the broadest sense and was described in a 1977 IUCN position paper as "Education that covers an enormously wide field of activity ranging from formal education in preparation for a vocation or specific qualification to nonformal education which merges with com-

munication, entertainment, and public relations work or even with liaison between governmental and non governmental organizations, community action groups and societies." Considerable emphasis was placed on fostering national and regional capabilities for planning and implementing environmental education activities. Out of these discussions the need was voiced to develop environmental education materials that would contain the appropriate content and methods that would be useful at a variety of levels and in different types of educational programs.

One result of the efforts was the publication of a series of publications which provided strategies for the integration of an environmental dimension into formal and nonformal education situations. Emphasis was placed on materials which contained both content and methods, and which would stimulate development of interdisciplinary teaching and learning approaches oriented towards environmental problem-solving.

Method

The review of Unesco/UNEP documents 2,3,4,5,7, and 8 was undertaken to determine their overall utility as teaching and instructional aids. The assessment was to be conducted with a view of building a collection of tested teaching/training materials and methods that would be of use to different target groups.

A team of internationally involved experts and practitioners in environmental education were to be selected to serve as reviewers of the specified documents. Representation was broadly sought from the major continental regions of the world and was to include individuals representing developing as well as developed countries.

A summary report was to be prepared by the principal investigators who themselves are actively involved in environmental education at the international level.

Reviewer Selection

The evaluation of the specified Unesco-UNEP modules was conducted attempting to utilize a review process involving at least two reviewers for each document included in the study who met the following criteria:

1. Knowledgeable about environmental education as evidenced from their scholarly records and active participation in professional environmental education organizations;
2. Actively involved in environmental education at the international level;
3. Involved in environmental education program design and implementation, preservice and inservice teacher education, and/or materials development; and
4. Familiar with the environmental education needs and aspirations of both the developing and the developed world.

Individuals were identified from rosters of professional environmental education organizations and in consultation with Unesco-UNEP representatives. Final selection was dependent upon the potential reviewers positive response to the invitation to participate.

Instrument Development

An evaluation instrument was designed to provide a common basis of comparison of the documents produced and in relation to considerations commonly used in educational practice in both the developing and developed countries of the world. Instrument design was based upon similar evaluation instruments that have been used for in-depth educational materials review in environmental and science education work by the Educational Resources Information Center (ERIC) for Science, Mathematics and Environmental Analysis Center Education (SMEAC) located at the Ohio State University, in Columbus, Ohio, USA.

A revision of the instrument was completed and subjected to scrutiny by the professional Science and Environmental Education Faculty of ERIC/SMEAC and selected

members of the Environmental Management Education faculty at The Ohio State University, School of Natural Resources, Columbus, Ohio (See Appendix 1).

The final draft was sent to each reviewer selected along with a letter providing detail on review procedures and response time and arrangements for the return of completed evaluations (See Appendix 2).

Data Analysis

Data were tabulated in the form of frequency responses from completed instruments. A verbal description of the summarized response patterns of the reviewers was prepared for each document. Heavy reliance was made upon comments by reviewers to summarize their professional opinions concerning the content scope, content accuracy, and the overall utility and quality of the document being reviewed. Obvious gaps or omissions observed in the modules were also noted. Information presented is based upon the presently available documents and completed reviews.

Document Distribution

Documents to be reviewed were to be provided to the reviewers by the Washington UNEP office at the beginning of the project. The lack of availability of the documents was to cause delays of from three to seven months in the review process. Promised delivery of a second set of documents was to have finally been accomplished by June, 1986, but continued correspondence with reviewers indicated that about one-half of the reviewers had yet to receive any documents for review by that date. As of this writing, only nine reviewers received documents while four of the reviewers have yet to receive any documents at all. The reviews presented are therefore not as complete as they might be because of the lack of availability and timely delivery of the necessary documents.

Module 2

Guide on Simulation and Gaming for Environmental Education

This document aims at providing basic knowledge for the purpose of stimulating specialists in charge of curricula and materials development, as well as teachers, to adapt existing games and simulations to their particular situation or to develop original materials of a similar kind. The authors recognize in the preface the scarcity of these types of education materials in most countries.

The document is divided into two major sections. Part One is an introduction to the elements of environmental gaming and simulation with emphasis on environmental consciousness, concepts of activities and role playing, explanation of gaming procedures, educational utility of the process and advantages and limitation of the approach. Part Two offers four existing environmental simulations and a format for teachers to use to develop their own games and simulations.

The document is a teachers guide that may be used at any public school level. Topics presented in the module as exemplary only then the document is non topic specific in terms of environmental issues packaged as an information or laboratory manual, the document can guide workshops or series of classes of normal students in activities that require a "minimum of three weeks" time according to the reviewers. No specific user group, such as urban versus rural or working class verses poverty class, was targeted by this document. Overall the document was given high marks for being interdisciplinary.

Although the rationale behind the materials were explained and objectives clearly stated, the objectives were not stated in behavioral terms which would foster evaluation. Emphases of the objectives were on cognitive and affective development and on building problem solving skills.

The content and methodology was rated as factually accurate and intellectually sound. Although some parts were viewed as being too abstract and too general, the document gave a good overview of the field of gaming and simulation. Reviewers did not elaborate on which areas were too abstract or too general.

Suggested instruction strategies by the reviewers were case studies, role playing, small group and whole class instruction. Teacher preparation for use of the material, in Module 2 was suggested to be multiple day workshops (larger than two days) which would address content, philosophy and skills development in gaming and simulations. Team teaching would be required.

From an evaluation perspective the reviewers indicated that, although bibliographic entries were included which would assist the user of games and simulation in evaluation, they knew of no formal evaluation studies of this approach. Suggested approaches to evaluation were practitioners contextuality, model impact assessment and procedural knowledge. The reviewers did indicate that determining the attainment of objectives of specific games would difficult because part of the evaluation would be to assess "fairness."

Overall ratings gave the module a four on a scale of one (low) to six (high). More examples of simulations and games are suggested. Those examples were suggested to include complete bibliographic data with extended abstracts. Certainly more references to developing countries are needed.

Primary strengths were the description of the four particular games and how to design games and simulations. Reviewers as stated earlier though, felt that part 1 could be improved by providing more concrete examples to illustrate concepts put fourth. Part one was viewed as "over academication."

Some specific areas for improvements are:

1. Reconsider the idea that machine or computer simulations are the most abstract of all gaming and simulation techniques. In countries where advance personal computers are available technology is emerging which will most realistically incorporate reliable data into scenarios for accurate, real world simulations of environmental problem solving.
2. Improve print on page 56, 88, 90, 99-101.
3. Expand on instructions so that non-English speaking users who translate the four games do not lose the meaning because of lack of cross culture understanding of some of the games rationale or "hidden meanings."
4. Recognize that for a portion of the developing world that the four simulations have no cultural content or context and thus are of limited use in even serving as a module for creating a culturally appropriate game.

In summary the reviewers agreed that "most of Part One is useful to academics in a given area. Part Two and the Part One chapter on gaming procedures are most useful for the practitioner in curriculum development and teacher training, especially for those who are faced with the challenge of designing games. In this regard more examples of games and simulations to illustrate the range of such activities would have been most helpful. Like-wise a section which provides abstracts and sources of games would have been useful. A need exists for games from non British sources, was needed especially materials from the third world. Lastly, it would have been most useful if a section had been presented which would aid the teacher in integrating these games into the current school curricula."

Module 3

Module Educatit Sur la Conservation

Et La Gestion Des Ressources Naturelles

This is one of the modules to which the principal reviewers could not gain access thus the review herein represents only one review from an environmental professional from a Spanish speaking country. The document was described as a teacher's guide

and student workbook which was primarily directed to classroom use. All settlement types were targeted (urban, suburban and rural) but the document was written primarily for middle class students at community or undergraduate colleges who are fast learners.

Activities are geared for a semester length course which has a focus of economics, geography, meteorology geology and engineering: No humanistics or aesthetics are involved.

The document received high marks for its description of the rationale and the clearly stated objectives. Objectives were also stated in behavioral terms which supported evaluation.

Major concepts addressed were ethics, natural resources and population. Materials were judged to be factually accurate and intellectually sound. Problems of renewable resource use including plants, animals, minerals and land use were addressed. The geographic focus was national.

This whole class instructional effort requires teachers to have an understanding of natural resources, water resources, mining and economics. A one to two day content workshop is suggested as the best method to help teachers prepare.

For evaluation, methods are suggested for determining whether stated objectives are met. Evaluation techniques indicated in the module include multiple choice questions, true/false tests and activities. No means were included to help the learner evaluate their progress nor were diagnostic instruments suggested.

Overall rating of the document was a four on a scale of one (low) to six (high). The reviewer suggested that a more multiple use perspective on water be taken. Items such as recreation and fishing should be included. A presentation of a statistical data base to reinforce the concept of the utility of water was suggested as one technique for strengthening the document. The reviewer felt the materials were not overly detailed and could be strengthened with data and actual examples.

In summary the review stated "The module is well arranged for both teachers and students but can not stand as a single document. Users are required to research the subject before having adequate information to proceed. Moreover, the materials do not include more recent and modern technologies utilized in resource management such as remote sensing."

Module 4

Educational Module on Environmental Problems In Cities

The international Environmental Education Program (IEEP) of Unesco has determined that the enhancement of the quality of the built environment is a basic priority for future environmental action. This module applies specifically to two continents, and is intended for use by elementary and secondary school teachers in clarifying certain essential scientific concepts while discussing the environmental problems of cities. The document provides some overall guidelines for teachers, along with a glossary of terms and a bibliography. The major portion of the book consists of information and teaching activities which deal with: (1) people and the city; (2) growth patterns and land use; (3) transportation; (4) urban climate (including air quality); (5) water quality; (6) urban solid wastes; (7) city noise problems; (8) nature in the city; and (9) energy. For each of the above sections the teacher is provided with background information and a list of concepts to be taught. Several activities then follow, written in a format which provides the appropriate grade level, the emphasis of the activity, amount of time required, materials needed, objectives, and procedures. Each section ends with a suggested objective test and the answers.

This teacher's guide and student workbook suggested that media such as readings, maps and charts, parks and community business be used to support the proposed classroom activities. Targeted audiences are of urban and suburban areas, but not rural;

suggested socio-economic groups are upper, middle and working classes, but not the poverty class.

The document is geared for fast learners, primarily college students and teachers, who participate in the module activities over a long period of time up to one year. The content scope of the document was listed as including geography, history, economics and sociology in the social science arena. In the natural-physical sciences listings included ecology, biology, chemistry, health and medicine, engineering and physical geography. Some literature is included.

Reviewers felt that materials were well explained as to rationale and included clear objectives that were defined in terms of expected behavioral outcomes. Objectives emphasized cognitive and affective development and development of problem solving skills.

The document has a wide content scope including ecology, culture, natural resources and population. The focus on topics of air, water, noise, thermal, solid waste, aesthetics mental and physical health, as well as all aspects of resource use gave the document a positive rating in terms of scope of content. The breadth of geopolitical and socioeconomic issues addressed further strengthened the ratings of the document. The use of examples from around the world greatly increases the utility of the module.

These materials, relating to a neighborhood, city and region, were judged as factually accurate and intellectually sound.

Teaching strategies suggested by reviewers were quite lengthy and included field trips, expositions, demonstrations, questions, tests, case studies, role playing, simulations, group discussions, surveys and polls, small group instruction and whole class instruction. To teach the subject matter it was suggested teachers have or obtain a background in ecology, geography, biology and engineering. One technique suggested for teachers to

gain this knowledge was a series of workshops or institutes which focused on both content and skills.

The authors conclude their module with a creative section on evaluation which includes role playing, a force field analysis sheet and a set of questions, all which will help the user evaluate their knowledge. No formal diagnostic instruments were suggested.

Overall the document received a rating of five and one half on a scale of one (low) to six (high). The primary strength was judged to be its comprehensiveness, the primary weakness was the amount of background knowledge required for the user to maximize the potential benefits of the modules. Reviewers suggest that because of the extensiveness of audio visual materials supporting this topic that wide use should be made of the them.

Module #5

Environmental Education: Module for Pre-Service Training of Teachers and Supervisors for Primary Schools.

Abstract

Module #5 emphasizes the pre-service training of elementary school teachers and supervisors in environmental education. The first section reiterates the historic and philosophic development of environmental education. Environmental problems are identified and a knowledge structure is provided that includes the socio cultural components of the environment as well as ecosystem dynamics. Environmental problems that are associated with natural and human caused interactions are addressed along with suggested approaches for problem mitigation. The second section describes strategies for including environmental education in the curriculum and describes various teaching approaches. Evaluation is discussed along with classroom management of environmental education for the elementary classroom.

Review

The document is a teachers guide that contains information and suggested approaches of use for curriculum supervisors. Media suggested predominantly comprise readings along with other approaches such as maps, charts, films, indoor and outdoor classrooms, parks, simulations and games and libraries.

Use characteristics, while not specified are suggested to be targeted on suburban, rural children and middle class socioeconomic backgrounds with average intellectual capacities.

The document is targeted at the teacher education level for educators involved with grades 4-6, 7-9 and possibly 10-12, though that is not the major focus. A variety of activities are presented that could be used as a year long program or as a series of modules or units.

The scope of content in the social sciences includes economics, geography, political science and some history, psychology, anthropology and sociology. The natural physical sciences topics extend from ecology, biology, chemistry, meteorology, health, and medicine, to geology, physics, physical geography and agronomy. Philosophy, religion and literature are also suggested. Information on Pedagogy, resource study and science education is also presented.

A rationale is specified and clearly stated objectives are provided. Objectives appear to emphasize the cognitive, affective and problem solving skill areas, but student behavioral objectives are not suggested.

Major concepts stressed include ecology, cultural, ethics, natural resources and population. Natural disasters and human caused disasters are also mentioned. The material presented appears to be factually accurate, but there is concern expressed by the reviewers that gaps in the presentational material exists. It is further indicated "that the biological basis which should underlie all sound EE material does not play

such a role here." Information is suggested to be fragmented with "concepts ranging from history, religion and philosophy that are interspersed with ethical and physio-chemical ones."

Problems or issues utilized include: pollution such as air, water, solid waste and radiation; physical health; resource use-including renewable and nonrenewable animal, plant and mineral resources; food production; recreation; and planning. Little information in relation to the social environment is provided. The scale of problems and information presented ranges from the neighborhood level to the community, state, national and world levels, including outer space.

The approach specified draws upon ecology, biology and education but is suggested to be "weak in the social sciences." Instructional strategies suggested emphasize laboratory, field trips, demonstrations, case studies, role playing, games and simulations, group discussions debates and both small group and whole class instruction.

Teachers preparation desired would include a background in ecology, the natural sciences and child centered discovery learning techniques. Inservice training suggested is a series of workshops that emphasizes content, philosophy and skills. Team teaching would be helpful and preparation time is suggested to be one hour or less per day.

Evaluation data of the recommended program was not available. No evaluation instruments, items or strategies are provided in sufficient detail to be useful. Little information is provided in relation to evaluation.

The overall rating by the reviewers was split with one reviewer indicating a relatively "high" rating and the other a "low" rating. Weakness included the fragmentation of information, a language level that is too high, and some topics like ecosystem dynamics being too detailed. The topic of "solutions to Human Population Growth and Settlement" is dealt with in 3 1/2 pages (pp 104-107) and that is suggested to be insufficient to justify the title. Such a topic should have been at the end of the volume with a

list of a variety of available solutions indicated. Other topics that could be added included economics and the environment, social aspects, valuing, problem solving and evaluation strategies. Examples should be drawn from areas of the world other than the Americas, like Africa, Asia, Latin America and the Middle East. It is further suggested that a primary teacher in Africa would find the level of language and sentence structure far too difficult and the receipt of a promising book to be, in practice, too difficult to comprehend.

Module #7

Environmental Education: Module for Pre-Service Training of Science Teachers and Supervisors for Schools

Abstract.

Module #7 is an experimental module that emphasizes pre-service training of secondary school science teachers and supervisors. Six chapters of the document address the following topics: (1) environmental problems and educational responses; (2) relationships between science education and environmental education including basic skills in science and environmental education and relationships among science, society and technology; (3) curricular tasks in the area of environmental education for science teaching emphasis that relate to environmental problem solving and action; (4) teaching strategies and activities; (5) program evaluation; (6) implementation strategies for environmental education at both the individual school and school district levels. Appendixes include a list of science concepts of use in environmental education, definitions, aims of environmental education, the declaration of the Tbilisi Intergovernmental Conference on Environmental Occasion, a description of the International Environmental Education Program (IEEP) of UNESCO and a bibliography.

Review

The document is a secondary school teacher's guide that contains selected readings appropriate for classroom use and it will also serve teacher educators for a semester or up to a year long involvement. Material is presented as a series of modules, units, and as a course. Topical emphasis ranges from some economics, geography, political science, history and anthropology as well as major emphasis on ecology, biology, chemistry, physics, agronomy physical geography, meteorology, and health applications.

A rationale and objectives are presented primarily in the cognitive domain with some emphasis on affective, psychomotor and problem solving skills and with relationship to a philosophic approach necessary for good environmental education.

Major concepts in the areas of ecology, natural resources management, and population are presented along with a consideration of culture, ethics, and broad science education concepts. Content accuracy is high and the program is judged to be intellectually sound.

Problems/issues presented include pollution, health, resource-use, food production/supply/distribution, population/resources ratios, planning, and urban and rural problems. The scale of issues presented is on the community level with primary emphasis at the world level. The approach used draws from both natural-physical and social sciences including biology, ecology and education.

Suggested instructional strategies are field trips, stories, case studies, independent study, simulations, surveys and polls and reading for background information and philosophic approach.

Teacher preparation required for use of the material presented is judged to be "modest" with some study of the natural sciences and child centered discovery learning techniques being desirable. A series of inservice workshops for implementation would

be useful that would emphasize content, philosophy and skills. Team teaching is suggested to be helpful.

Some approaches for evaluation of student performance are specified along with the evaluation of curriculum materials and environmental teaching. No specific examples of ready-to-use evaluation instruments for cognitive, affective skill acquisition by students are presented.

In the opinion of the reviewers an overall rating for the module is "average," midway between "high" and "low," is indicated. The main strengths suggested are that the module is readable, contains balanced content, uses numerous charts, tables and examples, and is the "right length." While it is suggested that the module would serve the stated purpose of giving an environmental dimension to science teaching at the secondary school level and is "interesting to read," some modifications are suggested. Units XIX and XX on evaluation should be expanded. The bibliography is too narrow and there are minor weaknesses concerning, for example, an unreadable chart on page 206, concept definitions on page 49 that should include examples for clarity, and an occasional incorrect figure as on page 11, where the third statement, line one states "...6000 tonnes of soil per year..." The statement should read "...6000 million tons..." The small type size on pages 219-220 may cause some readers problems as well.

The reviewers judge the document to be "useful for the target population anywhere in the world," but also indicate it would probably be "not helpful for highly developed countries." It is suggested that regional versions could be prepared for several pilot areas, e.g. West Africa (anglophone), Islands of the Indian Ocean, West Indies, Arab States and North America. It is further suggested that the program seems "to emphasize the technological society and its environmental problems while problems of the developing world seem to be overlooked."

Module #8

Environmental Education: Module for In-Service Training of Science Teachers and Supervisors for Secondary Schools

Abstract

(No document available for abstracting)

Review

The module is a teachers guide with sufficient information to also be used as a basic information manual. The media appropriate for use includes many different aspects from readings, maps, audio visual materials, and simulations. Suggested settings are also diverse and include indoor and outdoor laboratories, library, classroom, parks, camps, the business community and homes.

The target audience includes urban, suburban to rural while the socio-economic level implied appears to be middle to upper level.

Material described is suggested to be a series of units that could also be used as a 4-6 week unit. A broad scope of content is suggested involving most disciplines in both the social and natural sciences'. Religion and the plastic arts are also specified.

A rationale and objectives are provided that include cognitive and affective objectives, but with only minor emphasis on skills. Personal involvement in local community issues is also emphasized.

Major concepts are broad and include ecology, culture, ethics, natural resources and population. It is further emphasized that social issues are dependent upon knowledge from different academic disciplines for problem resolution.

The content is considered to be factually accurate and intellectually sound. It is indicated that the basic science data is sound, but some assertions about learning psychology are dubious while the "relevant sources [are] eclectic and contentious."

A broad range of problems and issues is presented from air, water and noise to thermal, solid waste, radiation and aesthetic pollution. Physical health and resource use in all of its aspects is also included. Most other content areas from food production and land use to population and urban problems are also presented. The scale of consideration is from micro-ecosystems to neighborhood, community and state levels, to nation, world region, and world.

The instructional approach draws from biology, the earth and physical sciences, and chemistry with a technological orientation and, to a lesser extent, economics, psychology, and sociology from the social sciences. Instructional strategies suggested, but not incorporated in the presentations made include laboratory experiences, field trips, role playing, independent study, games and simulations, group discussions, debates surveys and, of course, whole class instruction.

The module is especially for science teachers and is viewed to be most useful when used as a series of workshops or as a longer workshop or institute. Inservice training needed includes content, philosophy and skills. Preparation time is estimated to be about two hours per day.

Evaluative strategies for use with students are suggested. A variety of methods and instruments are defined, but none in detail. Examples are limited in scope. It is suggested that evaluative instruments be developed, but insufficient description is provided.

An overall rating of "average" is indicated by the reviewers. A strength is the review of background science information, though better illustrations would be helpful. A suggested weakness is wordiness, repetitiveness, and unnecessary educational jargon. Social science information required to understand environmental issues could be treated in a more systematic way. Typesize is difficult to read and the module contains a number of typographical errors. Some references will be difficult to trace. A curious

change in use of the personal pronoun "he" and the related collective "man" changes to a simple reference to "she" about midway through the module.

The module is suggested to be "scientifically interesting and useful, though not very well presented." Educationally it is suggested to be "...a bit disappointing, with much repetition" while more examples of what to do and how to do it would have been more useful... than a brief introduction to educational theory." The interdisciplinary aspect is well emphasized, but selected case studies could have been more helpful. It is suggested that a hypothetical study in urban or regional planning could have been worked through in detail with the contributions from the natural and social sciences explained in a more systematic way than simply indicating "do a survey" or "find out local community attitudes."

General Summary

Evaluations and ratings were summarized for each document reviewed and as a general summary to provide guidance and suggestions for document improvement. A General Summary indicating the responses of the reviewers to the documents en toto is attached as Appendix 3. Written comments were included in the narrative review of each document.

General Summary Statements

Some observations can be made and a list of statements relating those observations follows:

1. The reviewed materials are teachers guides that contain information of use in developing content background, student activities and in curriculum development;
2. Most information is oriented toward indoor classroom use and predominately consists of readings;
3. The target recipient audience is teacher's in urban to suburban areas who teach children in the lower-middle, middle, to upper socio-economics levels, and with an average to fast learner capacity;

4. Grade level is indicated by the reviewers to be at the teacher education or undergraduate university level;
5. A series of units, activities and courses are suggested;
6. A wide range of academic disciplines in the social and natural sciences and some aspects of the humanities are represented and the interrelatedness is well specified within the context of environmental concern;
7. The modules all contain a well defined rationale;
8. Objectives are clearly stated in each module and emphasize cognitive, affective and problem solving skills;
9. Concepts emphasized include natural resources, population, ecology, culture, ethics, and energy;
10. Teaching techniques are suggested in all modules;
12. The content is factually accurate and intellectually sound;
13. The full range of environmental issues in all areas of natural resources is included;
14. The scale of study is from the micro-ecosystem level to neighborhood, community, state, and national levels with some emphasis at the world level;
15. Instructional strategies indicated are many and include whole class instruction, field trips, case studies, role playing, games and simulations, and surveys and polls;
16. Inservice training is suggested to include content, skills and philosophy in the form of a series of workshops or a larger institute;
17. Preparation time is suggested to be two or more hours per day;
18. Some evaluative strategies are provided as examples;
19. Language level is indicated as too high in some documents;
20. Some topics, like "ecosystem dynamics," is viewed as being too detailed or difficult as presented for many elementary teachers;
21. Much of the information presented is not appropriate or applicable for many developing countries;
22. Many program strategies suggested are most appropriate for highly developed technological societies and not developing societies;
23. Repetition is a problem in several documents;

24. A general lack of availability of documents and timely response to requests for materials from Unesco-UNEP, regardless of country of office location, is a continuous and vexing problem.

Appendix 1

Reviewer _____
Date _____
Address _____
Telephone _____
Telex _____

UNESCO-UNEP ENVIRONMENTAL EDUCATION SERIES ANALYSIS INSTRUMENT

1.0 IDENTIFICATION OF MATERIALS/PROGRAM

- 1.1. Document Title _____
- 1.2. Sponsoring Institution _____
- 1.3. Sponsor Address _____
- 1.4. Title of Specific Document _____

2.0 SOURCE(S) OF MATERIALS/PROGRAM DESCRIPTION, OR ADDITIONAL INFORMATION

- 2.1. Publisher Address _____

Available items and date available:

- Materials _____
- Descriptive Information _____
- Evaluative Information _____
- Information _____
- Other (specify) _____

3.0 MATERIALS, MEDIA

- 3.1. Classify the Document: _____ Student Text
_____ Teacher's Guide
_____ Teacher Materials (transparency
masters, etc.)
_____ Games/Simulations
_____ Laboratory Kits
_____ Basic Information Manual or Data
Book
_____ Operational (Lab) Manual
_____ Student Workbook(s)
_____ Tests
_____ Microcomputer Software
_____ Other (specify) _____

- 3.2. Media Suggested for Use: _____ Readings
 _____ Maps, charts, and/or illustrations
 _____ Films
 _____ Filmstrips
 _____ Slides
 _____ Filmloops
 _____ Slide tapes
 _____ Tapes
 _____ Transparencies
 _____ Records
 _____ Artifacts
 _____ Indoor Laboratory
 _____ Outdoor Laboratory
 _____ Library
 _____ Classroom
 _____ Home
 _____ Urban or suburban park
 _____ Camp
 _____ Community business, agencies
 _____ Computer
 _____ Microcomputer
 _____ Simulations/Games
 _____ Other (specify) _____

4.0 USER CHARACTERISTICS

4.1. Target community characteristics:

- Settlement type: _____ urban
 _____ suburban
 _____ rural
 _____ Other (specify) _____
- Socio-economic: _____ upper middle class
 _____ middle class
 _____ working class
 _____ poverty area
 _____ Other (specify) _____
 (Ethnic Groups)

4.2. Special characteristics of student population:

- _____ mentally handicapped
 _____ physically handicapped
 _____ slow learners
 _____ fast learners
 _____ other (specify) _____

5.0 ORGANIZATION

5.1. Grade Level:

<input type="checkbox"/>	1-3	<input type="checkbox"/>	undergraduate
<input type="checkbox"/>	4-6	<input type="checkbox"/>	graduate
<input type="checkbox"/>	7-9	<input type="checkbox"/>	adult education
<input type="checkbox"/>	10-12	<input type="checkbox"/>	teacher education
<input type="checkbox"/>	junior or community college	<input type="checkbox"/>	Continuing interest (general public)
		<input type="checkbox"/>	other (specify) _____

5.2. Length:

<input type="checkbox"/>	Activity(ies)	<input type="checkbox"/>	Semester
<input type="checkbox"/>	Unit (1-3 weeks)	<input type="checkbox"/>	Year
<input type="checkbox"/>	Unit (4-6 weeks)	<input type="checkbox"/>	More than a year

5.3. Sequence:

<input type="checkbox"/>	Series of Activities	<input type="checkbox"/>	Course
<input type="checkbox"/>	Series of Modules	<input type="checkbox"/>	Series of courses
<input type="checkbox"/>	Series of Units	<input type="checkbox"/>	a. Block and Gap curriculum design
<input type="checkbox"/>	Special Projects	<input type="checkbox"/>	b. Spiral curriculum design

5.4. Scope: (check all that apply)

Social Science:

<input type="checkbox"/>	economics	<input type="checkbox"/>	psychology
<input type="checkbox"/>	geography	<input type="checkbox"/>	anthropology
<input type="checkbox"/>	political science	<input type="checkbox"/>	sociology
<input type="checkbox"/>	law	<input type="checkbox"/>	other (specify) _____
<input type="checkbox"/>	history		

Natural-physical science:

<input type="checkbox"/>	ecology	<input type="checkbox"/>	physics
<input type="checkbox"/>	biology	<input type="checkbox"/>	engineering
<input type="checkbox"/>	chemistry	<input type="checkbox"/>	physical geography
<input type="checkbox"/>	meteorology	<input type="checkbox"/>	agronomy
<input type="checkbox"/>	health and medicine	<input type="checkbox"/>	other (specify) _____
<input type="checkbox"/>	geology		

Humanistic-aesthetic:

<input type="checkbox"/>	plastic arts	<input type="checkbox"/>	philosophy
<input type="checkbox"/>	music	<input type="checkbox"/>	religion
<input type="checkbox"/>	literature	<input type="checkbox"/>	other (specify) _____

Other (specify):

6.0 RATIONAL AND OBJECTIVES

6.1. Is the rationale behind the materials/program explained? _____

6.2. Are these clearly stated as objectives? _____

Are the objectives stated in behavioral terms? _____

6.3. Do the objectives emphasize:

- _____ cognitive development
- _____ affective development, interests or attitudes
- _____ psychomotor skills
- _____ problem solving skills
- _____ other (specify) _____

7.0 WHAT MAJOR CONCEPT(S) ARE ADDRESSED (check all that apply)

- _____ Ecology: Interdependence of Living Things
- _____ Culture: Interaction with Environmental Considerations
- _____ Ethics: Humankind's Moral Responsibility for Environmental Considerations
- _____ Natural Resources: Management and Use
- _____ Population: Interactions with Environmental Conservation
- _____ Other (please specify):

8.0 CONTENT

8.1. Are the materials/program factually accurate? _____

8.2. Are the materials/program intellectually sound? _____

Please elaborate: _____

8.3. Problems/issues include:

- _____ pollution
 - _____ air
 - _____ water
 - _____ noise
- _____ health
 - _____ physical
 - _____ mental
- _____ resource use
 - _____ renewable
 - _____ non-renewable
 - _____ animal
 - _____ plant
 - _____ mineral
- _____ food production/supply/distribution
- _____ land use
- _____ recreation
- _____ population growth/distribution
- _____ population/resource ratio
- _____ political-legal jurisdictions
- _____ planning
 - _____ urban
 - _____ regional
- _____ economic development
- _____ urban problems
- _____ other (specify) _____
- _____ non-issue/problem oriented

8.4. Scale:

- _____ micro-system (e.g., vacant lot study)
- _____ neighborhood
- _____ community
- _____ metropolitan area
- _____ state
- _____ natural or cultural interstate region
- _____ national
- _____ world region
- _____ world
- _____ other (specify) _____

9.0 APPROACH

9.1. Multi- (inter-, cross-, non-) disciplinary approach:

_____ draws from several of the natural-physical sciences
(specify which): _____; _____; _____.

_____ draws from several of the social sciences (specify which):
_____; _____; _____.

_____ draws from both natural-physical and social sciences
(specify which): _____; _____; _____.

_____ based on a single discipline (specify): _____

9.2. Instructional Strategies

- _____ laboratory
- _____ field trips
- _____ exposition
- _____ stories
- _____ demonstrations
- _____ questions
- _____ tests
- _____ case studies
- _____ seminars
- _____ independent study
- _____ role playing
- _____ games
- _____ simulations
- _____ group discussions
- _____ debates
- _____ surveys and polls
- _____ individualized instruction
- _____ small group instruction
- _____ whole class instruction
- _____ other (specify) _____

10.0 TEACHER PREPARATION

10.1. Desirable education background (discipline concentrations)

10.2. Amount of inservice training needed to implement:

- _____ none
- _____ 1-2 day workshop
- _____ longer workshop or institute
- _____ series of workshops

10.3. Kind of inservice training needed:

- _____ Content
- _____ Philosophy
- _____ Skills

10.4. Team teaching: _____ required _____ helpful

10.5. Other: _____

10.6. Estimate the amount of daily preparation time needed:

- _____ more than 2 hours
- _____ 2 hours
- _____ 1 hour or less

11.0 EVALUATIVE DATA

11.1. Available from: _____

11.2. Not available: _____

11.3. Nature of evaluative data available:

Performed by: _____

Formative _____ Summative _____

Norm referenced _____ Criterion referenced _____

Reviewers judgement of the adequacy of evaluation done:

Description (where tested, results, design of research, etc.):

11.4. Availability of evaluation instruments for use by teacher:

Are methods suggested for determining whether stated objectives are met?

Describe the suggested methods or instruments. _____

Are means provided for the learner to evaluate his own progress?

Describe them. _____

Are diagnostic instruments suggested? _____

Describe them. _____

12.0 OVERALL JUDGEMENT AND COMMENTS OF THE REVIEWER

12.1. Overall rating of the materials/program by the reviewer:

Low High

12.2. What topics should be added or expanded? _____

12.3. What are the main strengths? _____

12.4. Are there any weaknesses? _____

12.5. Are any topics too detailed or difficult? _____

12.6. Explanation of overall reaction to the materials/program by the reviewer:

12.7. Unique characteristics of materials/program not covered in previous sections:

12.8. Additional Comments:

Appendix 2

UNESCO-UNEP Environmental Education

Series Analysis Project

Sponsored by:

Directed by:

Drs. Robert E. Roth, Gary W. Mullins & Craig Davis
School of Natural Resources - Environmental Education
The Ohio State University
2021 Coffey Road
Columbus, Ohio 43210 U.S.A.

Scope of Project

The UNESCO-UNEP International Environmental Education Programme has developed a document series of experimental modules for the pre-service and inservice training of primary school teachers, secondary-school science and social studies teachers in environmental education. This project seeks to evaluate those modules utilizing a select panel of international experts.

The objective of the study is to apply a systematic and rigorous assessment of these materials utilizing the assessment categories listed in the attached survey instrument. Data are to be compiled and quantitatively and qualitatively be assessed are reported to UNESCO-UNEP and the world community of environmental educators.

Directions to Evaluators

Please read the document to be evaluated carefully. Review the evaluation instrument and then check and/or complete all categories. Where a question is not applicable or you have no answer please so indicate. Make appropriate comments in the space provided. If further space is needed, attach and reference additional sheets. On item 12.8 a brief summary of your assessment would be most helpful. You may keep the set of documents provided.

Please return your assessment to The Ohio State University within 30 days of receipt. This will enable your assessment to be tabulated with the other data. Upon receipt of your review an honorarium of \$_____ U.S. will be made out to _____ or the professional association of your choice as a contribution in your name (please indicate which). Your input as a world expert is needed to insure an appropriate assessment of the UNESCO-UNEP material. Thank you for your willingness to participate in this important project.

ISEE

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Dr. L. Keith Caldwell, Secretary
Dr. Leon de Rosen
Lt. Col. Fatesingh Rao Gaekwad
Dr. Mohamed Kassas
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The Biosphere (ISEE Newsletter)

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1007 WARE Building
Madison, WI 53705 USA

The International Society for Environmental Education *In affiliation with the IUCN Education Commission*

MEMORANDUM

SUBJECT: UNEP Environmental Education Review
Project

DATE: July 11, 1986

FROM: Craig Davis, Secretary General

TO: Module Review Team

At long last, here are the modules that you agreed to review. We have enclosed copies of the review instrument in case you have misplaced the ones sent earlier.

We are still trying to get reviewing completed in time for us to prepare a summary report during the annual ISEE meeting on September 9 and 10. Therefore, to give us time to organize review comments we ask that you complete your review and send it to us by August 25 at the latest. I know that this is a rapid turn around for you, especially after waiting several months for the modules, but I know you will understand.

We are looking forward to receiving your reviews.

CBD:jg

Encl.

cc: A. B. Sacks
R. E. Roth
G. W. Mullins

"Education for Sustainable Development"

Appendix 3

APPENDIX 3

GENERAL SUMMARY

Reviewer _____
Date _____
Address _____
Telephone _____
Telex _____

UNESCO-UNEP ENVIRONMENTAL EDUCATION SERIES ANALYSIS INSTRUMENT

1.0 IDENTIFICATION OF MATERIALS/PROGRAM

1.1. Document Title _____
1.2. Sponsoring Institution _____
1.3. Sponsor Address _____
1.4. Title of Specific Document _____

2.0 SOURCE(S) OF MATERIALS/PROGRAM DESCRIPTION, OR ADDITIONAL INFORMATION

2.1. Publisher Address _____

Available items and date available:

Materials _____
Descriptive Information _____
Evaluative Information _____
Information _____
Other (specify) _____

3.0 MATERIALS, MEDIA

3.1. Classify the Document:	<u>1</u>	Student Text
	<u>11</u>	Teacher's Guide
	<u>1</u>	Teacher Materials (transparency masters, etc.)
	<u>1</u>	Games/Simulations
	<u>2</u>	Laboratory Kits
	<u>2</u>	Basic Information Manual or Data Book
	<u>1</u>	Operational (Lab) Manual
	<u>3</u>	Student Workbook(s)
	<u>3</u>	Tests
	<u>3</u>	Microcomputer Software
	<u>3</u>	Other (specify) <u>Curriculum Development</u> <u>Teachers Training Guide</u>

3.2. Media Suggested for Use:	<u>7</u>	Readings
	<u>4</u>	Maps, charts, and/or illustrations
	<u>2</u>	Films
	<u>1</u>	Filmstrips
	<u>1</u>	Slides
	<u> </u>	Filmloops
	<u> </u>	Slide tapes
	<u> </u>	Tapes
	<u>1</u>	Transparencies
	<u>2</u>	Records
	<u>1</u>	Artifacts
	<u>3</u>	Indoor Laboratory
	<u>3</u>	Outdoor Laboratory
	<u>4</u>	Library
	<u>8</u>	Classroom
	<u>3</u>	Home
	<u>3</u>	Urban or suburban park
	<u>3</u>	Camp
	<u>2</u>	Community business, agencies
	<u>1</u>	Computer
	<u> </u>	Microcomputer
	<u>5</u>	Simulations/Games
	<u>1</u>	Other (specify) <u>workshop</u>

4.0 USER CHARACTERISTICS

4.1. Target community characteristics:

Settlement type:	<u>5</u>	urban
	<u>6</u>	suburban
	<u>4</u>	rural
	<u>4</u>	Other (specify) <u>all, makes no difference, not specified (2)</u>
Socio-economic:	<u>5</u>	upper middle class
	<u>5</u>	middle class
	<u>4</u>	working class
	<u>1</u>	poverty area
	<u>3</u>	Other (specify) <u>professionals</u> (Ethnic Groups)

4.2. Special characteristics of student population:

<u> </u>	mentally handicapped
<u> </u>	physically handicapped
<u>1</u>	slow learners
<u>4</u>	fast learners
<u>3</u>	other (specify) <u>normal average learners</u> professionals teacher trainers

5.0 ORGANIZATION

5.1. Grade Level:

<u> </u>	1-3	<u> 5 </u>	undergraduate
<u> 1 </u>	4-6	<u> 1 </u>	graduate
<u> 2 </u>	7-9	<u> 1 </u>	adult education
<u> 2 </u>	10-12	<u> 6 </u>	teacher education
<u> 3 </u>	junior or community college	<u> </u>	Continuing interest (general public)
		<u> </u>	other (specify) _____

5.2. Length:

<u> 1 </u>	Activity(ies) Unit (1-3 weeks)	<u> 3 </u>	Semester
<u> 1 </u>	Unit (4-6 weeks)	<u> 1 </u>	Year
<u> 1 </u>	Min of 3 weeks	<u> 5 </u>	More than a year

5.3. Sequence:

<u> 4 </u>	Series of Activities	<u> 1 </u>	Course
<u> 3 </u>	Series of Modules	<u> 3 </u>	Series of courses
<u> 6 </u>	Series of Units	<u> </u>	a. Block and Gap curriculum design
<u> 1 </u>	Special Projects	<u> </u>	b. Spiral curriculum design

5.4. Scope: (check all that apply)

Social Science:

<u> 7 </u>	economics	<u> 4 </u>	psychology
<u> 8 </u>	geography	<u> 3 </u>	anthropology
<u> 5 </u>	political science	<u> 5 </u>	sociology
<u> 2 </u>	law	<u> </u>	other (specify) _____
<u> 4 </u>	history		

Natural-physical science:

<u> 9 </u>	ecology	<u> 6 </u>	physics
<u> 7 </u>	biology	<u> 5 </u>	engineering
<u> 5 </u>	chemistry	<u> 7 </u>	physical geography
<u> 6 </u>	meteorology	<u> 4 </u>	agronomy
<u> 6 </u>	health and medicine	<u> 1 </u>	other (specify) <u>Environmental Science</u>
<u> 5 </u>	geology		

Humanistic-aesthetic:

<u> 2 </u>	plastic arts	<u> 4 </u>	philosophy
<u> </u>	music	<u> 3 </u>	religion
<u> 3 </u>	literature	<u> 1 </u>	other (specify) <u>Not available</u>

Other (specify):

6.0 RATIONAL AND OBJECTIVES

6.1. Is the rationale behind the materials/program explained? 11-yes

6.2. Are these clearly stated as objectives? 11-yes

Are the objectives stated in behavioral terms? 8-yes 2-no

6.3. Do the objectives emphasize:

<u>10</u>	cognitive development
<u>8</u>	affective development, interests or attitudes
<u>3</u>	psychomotor skills
<u>6</u>	problem solving skills
<u>3</u>	other (specify) <u>philosophical approach</u> <u>values in culture</u>

7.0 WHAT MAJOR CONCEPT(S) ARE ADDRESSED (check all that apply)

<u>6</u>	Ecology: Interdependence of Living Things
<u>6</u>	Culture: Interaction with Environmental Considerations
<u>5</u>	Ethics: Humankind's Moral Responsibility for Environmental Considerations
<u>9</u>	Natural Resources: Management and Use
<u>7</u>	Population: Interactions with Environmental Conservation
<u>3</u>	Other (please specify): <u>All of the above, energy, personal involvement in local comm.</u> <u>issues, teaching techniques/</u>

8.0 CONTENT

8.1. Are the materials/program factually accurate? 8-yes

8.2. Are the materials/program intellectually sound? 9-yes

Please elaborate: _____

8.3. Problems/issues include:

<u>9</u>	pollution		
	<u>6</u>	air	<u>5</u> thermal
	<u>6</u>	water	<u>6</u> solid waste
	<u>5</u>	noise	<u>4</u> radiation
			<u>5</u> aesthetic
<u>6</u>	health	/	
	<u>5</u>	physical	
	<u>2</u>	mental	
<u>9</u>	resource use		
	<u>8</u>	renewable	
	<u>7</u>	non-renewable	
	<u>5</u>	animal	
	<u>7</u>	plant	
	<u>7</u>	mineral	
<u>7</u>	food production/supply/distribution		
<u>7</u>	land use		
<u>6</u>	recreation		
<u>7</u>	population growth/distribution		
<u>6</u>	population/resource ratio		
<u>4</u>	political-legal jurisdictions		
<u>6</u>	planning		
	<u>7</u>	urban	
	<u>5</u>	regional	
<u>4</u>	economic development		
<u>7</u>	urban problems		
<u>3</u>	other (specify) _____		
	non-issue/problem oriented		

8.4. Scale:

<u>4</u>	micro-system (e.g., vacant lot study)
<u>5</u>	neighborhood
<u>6</u>	community
<u>5</u>	metropolitan area
<u>6</u>	state
<u>4</u>	natural or cultural interstate region
<u>5</u>	national
<u>3</u>	world region
<u>4</u>	world
<u>4</u>	other (specify) <u>all of the above, general strategies which</u> apply to all of the above, space

9.0 APPROACH

9.1. Multi- (inter-, cross-, non-) disciplinary approach:

5 draws from several of the natural-physical sciences
(specify which): _____; _____; _____.

6 draws from several of the social sciences (specify which):
_____; _____; _____.

6 draws from both natural-physical and social sciences
(specify which): _____; _____; _____.

_____ based on a single discipline (specify): _____

9.2. Instructional Strategies

<u>3</u>	laboratory
<u>7</u>	field trips
<u>2</u>	exposition
<u>2</u>	stories
<u>4</u>	demonstrations
<u>3</u>	questions
<u>1</u>	tests
<u>6</u>	case studies
<u>3</u>	seminars
<u>4</u>	independent study
<u>5</u>	role playing
<u>5</u>	games
<u>6</u>	simulations
<u>4</u>	group discussions
<u>4</u>	debates
<u>5</u>	surveys and polls
<u>2</u>	individualized instruction
<u>3</u>	small group instruction
<u>5</u>	whole class instruction
<u>2</u>	other (specify) <u>reading for background info and philosophy</u> of approach

10.0 TEACHER PREPARATION

10.1. Desirable education background (discipline concentrations)

10.2. Amount of inservice training needed to implement:

 none
 1-2 day workshop
 5 longer workshop or institute
 6 series of workshops

10.3. Kind of inservice training needed:

 11 Content
 8 Philosophy
 10 Skills

10.4. Team teaching: 3 required 7 helpful

10.5. Other: _____

10.6. Estimate the amount of daily preparation time needed:

 3 more than 2 hours
 4 2 hours
 1 1 hour or less

11.0 EVALUATIVE DATA

11.1. Available from: _____

11.2. Not available: 6 _____

11.3. Nature of evaluative data available:

Performed by: _____

Formative 2 Summative 1

Norm referenced 1 Criterion referenced 1

Reviewers judgement of the adequacy of evaluation done:

Description (where tested, results, design of research, etc.):
