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TECHNICAL ASSISTANCE IN ENVIRONMENTAL EDUCATION TO THE TUNISIAN INSTITUTE FOR APPROPRIATE TECHNOLOGY

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SUMMARY

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As a part of the Tunisian Institute for Appropriate Technology (TIAT) project on "Integrated Development" for the Skhira region in Tunisia, TIAT has asked the International Institute for Environment and Development (IIED) to provide technical assistance in developing an outdoor environmental program and an environmental center for the Skhira village which will serve as a model for other schools and regions in Tunisia.

In preparation for this technical assistance the consultant, at the request of TIAT, reviewed some of the standard U.S. programs and materials in outdoor environmental education, analyzed the key elements that should be considered in the development of an outdoor education program in Tunisia and formulated general recommendations for consideration by TIAT.

The consultant then visited TIAT in Tunisia and discussed with them their plans for developing a model project in outdoor education and assisted them in developing an outline for that project.

The main objective of the TIAT project is to develop awareness, interest and knowledge about the environment among the students and the public.

TIAT is expecting, for their project, assistance from the Tunisian government and from the local community and local resources to meet most of the requirements for the above project. However, TIAT would like to have the following assistance, which can not be provided locally:

1. Funds for audiovisual materials and equipment for an amount of $18,039.18.

2. Recruitment of two volunteers to assist in the project for a period of two years.

3. Part time consultancy in areas of curriculum development, testing and evaluating, environmental workshops, and other areas, as the need arises (4-6 months over a period of two years.)

It is the consultant's opinion that the above assistance is very much needed and is vital for the success of the projects.

I. INTRODUCTION

IIED contracted the consultant in response to a request from the Tunisian Institute for Appropriate Technology (TIAT) for technical assistance to help in designing an outdoor environmental education program for a specific community in Tunisia.

The consultant's contractual agreement was carried out in two phases. The first phase involved reviewing some of the standard U.S. programs and materials in outdoor environmental education. The second phase took place in Tunisia working directly with TIAT to develop a demonstration project. A proposal and partial budget for an environmental education program was prepared.

II. SCOPE OF WORK

- Review of information and material on some of the existing outdoor environmental education programs in the U.S. that might be relevant to the Tunisian situation.
- Highlight the key elements that should be considered in the development of an outdoor education program for Tunisia.
- Review information and material related to the Tunisian environmental situation, to the Tunisian Institute of Appropriate Technology, and to the Tunisian Ministry of Education.
- Review the Tunisian school curriculum (elementary level) for existing environmental contents and make suggested improvements.
- Discuss with the Tunisian Institute for Appropriate Technology their plans for developing a demonstration project in outdoor environmental education.
- Assist the Tunisian Institute for Appropriate Technology in developing a project outline for an outdoor environmental education program to be submitted to the Ministry of Education.
- Discuss with the Ministry of Education the options for implementing the Tunisian Institute for Appropriate Technology's plan.
- Suggest a time schedule and follow-up program for the project.

III. PHASE I: REVIEW OF ENVIRONMENTAL EDUCATION IN THE U.S. AND ITS RELEVANCE TO TIAT

A. SUMMARY

The consultant reviewed some of the standard environmental education programs of the U.S. as well as a variety of other U.S. environmental education materials. Materials reviewed were those recommended by local environmental educators and those with which the consultant was familiar. These included standard projects such as:

Project Learning Tree
Project Wild
The Class Project

The consultant also reviewed manuals and publications of different environmental centers and organizations such as the Fish and Wildlife Service publications:

Migratory Birds
Hunting and Wildlife Management
Wetland Conservation and Use
Fresh Water Marsh
Wildlife Conflicts
Hot Deserts
Urban Areas
Endangered Species

The series "Nature Scope", which was published by the Wildlife Federation:

Wild About Weather
Incredible Insects
Discover Deserts
Birds, Birds, Birds

Publications from the Center of Environmental Education included:

Whaling
Tortugas Marinas
Joy of Learning
Nature with Art
Turtle Hackling

These were reviewed in addition to many other references, reports and manuals in the field of environmental outdoor education and conservation (see Appendix 1).

The consultant also had the opportunity to meet with a number of professionals working in the field of environmental

education and in related fields. He also met with representative from organizations such as: National Wildlife Federation, United Nations Environment Program, U.S. Fish and Wildlife Service, Council on Environmental Quality, Center for Environmental Education and others (see Appendix 2).

B. U.S. ENVIRONMENTAL EDUCATION MATERIALS ADAPTED TO THE NEAR EAST.

The review of the U.S. environmental programs and literature has shown that there is an abundance and variety of references that could be used in developing environmental curriculum activities and teaching and training materials for the Near East region. However, in the consultant's opinion, these references should be used only as a guide because none of the standard environmental projects reviewed or observed could be applied or implemented, as they stand, to plan a national environmental education curriculum for Tunisia or the Near East region. This is because each country has its own environmental and educational needs.

However, while these materials can not be applied as they stand, the U.S. material has been pioneering and has greatly informed the environmental education literature. For example, units with a thematic focus such as: soil, ecology, birds, deserts, urban life, plants, animals, endangered species, etc., could be adapted and made relevant to the local situation. Some units like "weather" are universal and could be adapted with few changes.

A successful environmental program, for any country, in the opinion of the consultant, should meet the following criteria:

- Fulfill the local goals and objectives;
- Meet the needs, interests and readiness level of the students;
- Consider the resources of the country and its school system and other means of education through informal channels;
- Consider the culture, traditions and beliefs of the country;
- Complement the country's existing school program;
- Consider the unique environmental situation of the country;

Based on the review of the U.S. references the consultant would like to recommend the following guidelines and criteria for the Tunisian environmental outdoor programs:

As a guideline such an environmental program should:

- provide knowledge, skills, techniques and experiences about the environment and the out-of-door education;
- enhance conservation, outdoor recreation and nature study;

- provide awareness and appreciation for natural resources and the limitations on their use;
- develop lifelong outdoor and environmental interests;

In addition, the program should:
- be related to the environment problems and resources of the country;
- have clear behavioral objectives;
- have qualified and dedicated personnel to run the activities;
- have adequate facilities and materials;
- have sequentially planned curricula;
- provide for active participation of the students;
- provide for diversified activities;
- consider the needs and interests of the students;
- consider the culture and traditions of the country;
- be scientifically sound;
- provide for individual differences;
- be interesting and attractive.

IV. PHASE II: COUNTRY VISIT TO TUNISIA

A. MAIN ACTIVITIES CARRIED OUT IN TUNISIA

o The consultant held intensive meetings with the Tunisian Institute for Appropriate Technology to obtain background information on the organization and their consultancy needs, and to assist them in developing an overall plan for an outdoor environmental education program. He also visited the site of their project in the village of Skhira, and met with the village leaders and with the school director there.

o The consultant met with the Tunisian Ministry of Education and discussed with them their interest and plans to introduce environmental education into the school system, and of cooperating with the Tunisian Institute for Appropriate Technology in that respect.

o The consultant met with the United Nations Development Program (UNDP) representative in Tunisia and discussed their proposed joint project with the Tunisian Institute for Appropriate Technology (The Integrated Developmental Project for Skhira Region) and the relationship between that project and the environmental education project. He also met with two French experts who were assisting the Tunisian Institute for Appropriate Technology to develop the above project.

o The consultant also had the chance to attend the opening and closing sessions of the Conference on

Conciliation between Development and Environmental Protection, organized by the Tunisian Association for Nature and Environment and the German Foundation of Freidrich Naumann. He also attended some of the receptions and activities of the conference. This gave him the chance to meet with many of the personalities working in the field of environment in Tunisia. (See Appendix 3)

B. BACKGROUND INFORMATION OF THE TUNISIAN INSTITUTE FOR APPROPRIATE TECHNOLOGY

The Tunisian Institute for Appropriate Technology (TIAT) was established in 1980. The founder and current president is Mr. Cherif Zaooch. The board members (12 in number) are professionals in a variety of fields and are nationally recognized (see Appendix 4).

TIAT is run by volunteers and has no paid staff at present. The main programs of TIAT are in rural development and applied technology. They also carry out consultancy work and organize workshops and conferences in the field of environment and appropriate technology.

The TIAT office was located in Sidi Bou Ali in Tunis, and is now in the process of being moved to Skhira where the main project of the Institute, the "Integrated Rural Development of Skhira Region", will take place.

The Integrated Rural Development Project of the Skhira Region was developed in 1982 and emphasizes the social and economic development of the region by capitalizing on the present potentials and by introducing the needed "appropriate technology". The main objectives of the project are to introduce modern methods of agriculture and irrigation, provide loans and technical assistance, and assist the villagers in marketing their products.

The Integrated Rural Development Project originally expected funding from UNESCO. This funding did not materialize due to the financial difficulties UNESCO faced during the early period of the project. This forced TIAT to look for other sources of funding.

In support of the Integrated Rural Development Project, TIAT is in the process of signing an agreement with the United Nations Development Program (UNDP), whereby UNDP will commit an amount of $385,000 in the form of technical assistance, equipment, and training for the project. Also the Tunisian and the Canadian governments and the Canadian University of Lavel are expected to contribute to the project. The total budget for the project is expected to exceed $1,000,000.

TIAT has formed a special committee to oversee the "Integrated Rural Development Project of Skhira Region". The committee is composed of twelve members. Some of the members are from the village of Skhira and the rest of them are from TIAT. (see Appendix 5)

V. TIAT ENVIRONMENTAL PROJECT

A. INTRODUCTION

By the time the consultant arrived in Tunisia, TIAT had decided to coordinate their future environmental education efforts with the Integrated Rural Development Project. The consultant helped TIAT plan and develop an environmental component for this larger project. This component has a twelve year plan in four major areas of environmental programming. TIAT would like to have assistance in developing an environmental program and an environmental center, which will serve Skhira's school and at the same time be used as a model for other schools and regions in Tunisia.

Three main objectives have been identified for the project:

1. To develop awareness, interest and knowledge about the environment among the students and the public.

2. To develop and test teaching materials and training programs on environmental education.

3. To set a model for a sound and informative environmental education program for Tunisia and for other developing countries as well.

B. PROJECT COMPONENTS

In order to reach these objectives, TIAT would like to do the following:

1. Organize an outdoor environmental program at the school.

2. Improve the formal environmental education program in the village schools. A media room will be an integral component to this program.

3. Introduce environmental education to one of the teacher training institutes.

4. Establish an environmental center to test and develop teaching material, and to train teachers and youth leaders on environmental education.

1. OUTDOOR ENVIRONMENTAL EDUCATION PROGRAM

TIAT would like to develop an outdoor environmental education program to meet one of their main objectives. Outdoor Education provides skills, knowledge, techniques and experiences about the environment and out-of-doors. The main goal is to provide awareness and appreciation for natural resources and the limitations on their use.

To reach this goal, TIAT would like to utilize the free time of the students by introducing educational workshops. TIAT has been allocated five hectares of fertile land by the Tunisian government which is located across the street from the school. This is where they propose to conduct the outdoor environmental education workshops.

On this land is a dry pond which has a depth of 5-35 meters. The water for the pond will be pumped from the nearby river which is a few hundred meters from the pond. Under the joint UNDP-TIAT Integrated Development project, UNDP will provide a High Lift Turbine Pump which will provide enough water to maintain the pond and irrigate the land in the region.

The themes that they propose for the initial workshops are: animals, aquatics, agriculture and birds. Two other workshops to be added are on energy and small industries and crafts. They expect to produce goods from these workshops. For example, they hope to establish a garden and have dairy livestock.

The workshops will be attended by the students during their free time and will be viewed as extra-curricular activities. The products from this program will be used to enrich the school meal program, and any excess will be sold and its income will be used to cover operating expenses. The animals, birds and additional equipment is expected to be donated by the Tunisian government.

2. FORMAL ENVIRONMENTAL EDUCATION PROGRAM

A second component of this project is that TIAT would like to strengthen the formal environmental education program at the Skhira School, by adding to the present curriculum, providing audiovisual materials, and training current teachers on environmental issues. The workshop program for outdoor environmental education, then, will be complementary to this more formal agenda.

The consultant reviewed, with TIAT, the present school curriculum which led to suggested changes that would incorporate an environmental component into the classes. One unit suggested by the consultant that could be used as a model is called "Man and His Environment". From grades I-VI, the TIAT could include issues such as the importance of water, cleanliness, and the

dangers of noise, air and water pollution into their education program. (See Appendicies 6 and 7 for detailed curriculum)

In addition to appending the students' curriculum, TIAT is proposing to train the Skhira schoolteachers as well. This would include a 40 hour training course for the teachers and the main activities would be the following:

- -Program and objectives of the training course;
- -Environmental problems in Tunisia;
- -Environmental education: objectives, program, contents, and teaching methods;
- -The environmental curriculum for the Skhira school;
- -Planning of a model teaching lesson in environmental education;
- -Application and practice: a model lesson;
- -Planning a teaching unit;
- -Improving the environmental education program;
- -Follow-up training (twice a month at the rate of 2 hrs. each session) during the school year.

Each session will run anywhere from one to four hours. The follow up sessions are intended to address problems and evaluate and plan new programs.

3. ENVIRONMENTAL EDUCATION IN THE TEACHER TRAINING INSTITUTES

A third component in this project is to strengthen the educators' capabilities by introducing environmental education to one of the teacher training institutes. This would be a first step, which would lead to its incorporation into other institutes. The Ministry of Education agreed in principle to cooperate with TIAT.

Environmental education would be incorporated into the curriculum in physical sciences, Islamic Studies, Natural Sciences, History and Goegraphy and the arts. It would be incorporated during the regular four year program in an integrative manner (See Appendix 8).

4. THE ENVIRONMENTAL CENTER

The last component of this program is the Environmental Center for Outdoor Education (ECOE) which is expected to play a leading role in developing appropriate educational materials, testing and monitoring the effectiveness of the teaching materials, training personnel and researching and preparing basic reference material.

TIAT would establish the center on the land designated to the project. Local material and free labor will be used in building the center.

The main objectives in establishing the center, as seen by the TIAT, are to:

- o Develop awareness, interest and knowledge about the environment among the students.
- o Develop programs.
- o Direct the children's attention toward environmental issues and motivate them to participate in the conservation movement.
- o Pilot-test teaching materials.
- o Educate and motivate the public.

These objectives will be met by carrying out the main activities of the center.

The Main activities of the Center will be to:

- o Run a practical environmental program for the school.
- o Assist the schools in organizing extracurricular activities.
- o Test and develop teaching materials and programs.
- o Hold visitation programs for the students, for teachers in training, for leaders of outdoor/environmental clubs, and for the public.
- o Establish a resource library and media center (films, slides, posters, etc.)
- o Organize film shows for the students and the public.
- o Organize lectures, displays and exhibitions.
- o Use the mass media for environmental communications programs.
- o Publish: textbooks, charts, teaching units, etc.
- o Run training programs for teachers and teachers in training.
- o Train professionals working in the field of environment.

Their goal is to develop three centers over a period of seven years.

VI. CONCLUDING DISCUSSIONS

A. GENERAL RECOMMENDATIONS

After several days of discourse with TIAT and local leaders around the Skhira region, the consultant and TIAT arrived at the plan that is described above. Originally, the consultant planned to suggest a "pilot" project that TIAT could initiate immediately. After careful consideration and numerous discussions with TIAT, it was agreed that a pilot project was not appropriate, but rather a more formal, long-term project as part of a larger project, already in operation, would be more useful for the needs of TIAT and the village.

In this light, it was agreed that TIAT would need assistance in a number of capacities.

1. TIAT would like to request two Peace Corps volunteers for a period of two years to assist in all aspects of the project including:

   a. lead the local volunteers
   b. assist in building the center and planning the workshops
   c. assist in running the center and workshops
   d. assist in the training program
   e. develop curricula and teaching materials
   f. test curricula and teaching materials
   g. assist in evaluation

2. TIAT is seeking funding for the audio-visual materials which are an integral component of the formal education program. They have requested $18,040 and the expenses are detailed in Appendix 9.

3. TIAT should have a part-time consultant through the first two years of the project. This may include consultation on: curriculum development, workshops and testing and evaluation.

B. SUGGESTED SEQUENCE OF EVENTS

TIAT and the consultant have outlined a schedule for the proposed activities. (See Appendix 10 for original chronology) The proposed steps are as follows:

1) TIAT should submit a proposal to the Ministry of Education (MOE) as early as possible.

2) AID should be notified as soon as the MOE approves the proposal.

3) Peace Corps volunteers will join the project as soon as the media room is built. The audio-visual material will be sent at this point.

4) Training course for the teachers of the Skhira school begins.

5) Planning of workshops

6) Planning of the environmental curriculum for the teacher training institutes and the Skhira schools.

7) Introduce the environmental education programs into both institutions.

8) Build the Environmental Center

9) Open the center

10) Begin to evaluate the programs

11) Test the curriculum and teaching material.

12) Introduce the curriculum to other schools and teacher training institutes.

13) Open the other environmental centers: one in the desert region and one in the sea region.

C. CONCLUDING REMARKS

The consultant believes that this project has great potential to develop into a model project for the region. However, due to the fact that TIAT has limited organizational capabilities and resources, it is essential that the sequence of events, as outlined above, be followed to ensure an effective project.

The consultant also emphasizes that technical assistance and consistant monitoring of the project, through the presence of volunteers and short-term consultants, is vital for the success of this project.

APPENDIX 1

SOME OF THE RELEVANT REFFERENCE THAT I REVIEWED (FIRST REVIEW):

1. Project Learning Tree: Supplementary Activities Guide for Grades 7 Through 12, the American Forest Institute, Inc., Washington D.C., 1975.

A modle environmental education program for grades 7-12. Most of the activities in this book could be adopted to the Tunisian situation.

2. Project Learning Tree: Supplementary Activities Guide for Grades K Through 6, the American Forest Institute, Inc., Washington D.C., 1975.

A good manual for environmental education (K-6). Most of the activities could be adopted to the Tunisian situation.

3. Project Wild: Elementary, Western Regional Education Council, Boulder, Colorado, 1985.

An interdisciplinary environmental guide on: environmental awarness, diversty of wildlife, conservation, and people. Activity oriented. Wide variety of activities that could be adopted.

4. Project Wild: Secondary, the Western Regional Environmental council, Boulder, Colorado, 1985.

Activities could be used as a supplement to existing courses, emphasizes awareness, knowledge and constructive behavior concerning wildlife and the environment. A good guide for teachers. Rich with activities. Could be adopted to the Tunisian situation.

5. The Class Project, National Wildlife Federation, Washington D.C., 1984.

A series of active projects in the field of energy, environmental issues, Forests, hazardous substances and wildlife habitat management. A very good grogram and a source for many activities that could be adopted.

6. Nature Scope: Incredible Insects, National Wildlife Federation, Washington D.C., 1984.

A very good resource activity book on insects, grade K-7. Could be used to develop a teaching unit on insects at different grade levels.

7. Nature Scope: Wildly About Weather, National Wildlife Federation, Washinton D.C., 1985.

Nicely planned activities on weather for different levels (K-7). Most of these activities are universal and could be applied in any country. A good resource for any unit on weather.

8. Nature Scope: Descover Deserts, National Wildlife Federation, Washinton D.C., 1985.

It includes backgroud information and activities on deserts. Very good resource for developing teaching units on deserts.

9. Welands Conservation and Use, U.S. Fish and Wildlife Service/ Department of Interior, Washington D.C., 1984.

Series of activities on wetland habitats (grade 4-7). Good illustrations. Could be used as a refference in developing teaching units on similar subjects.

10. Wildlife conflicts, U.S. Fish and Wildlife Service/Department of Interior, Washington D.C., 1984.

Series of activities on wildlife (grades 4-7). Good illustration: A good refference for developing teaching units on wildlife.

11. Urban Areas, U.S. Fish and Wildlife Service/Department of Interior, Washington D.C., 1984.

It deals with urban development and its effects on plants and wildlife. Could be used in developing teaching units on urban development.

12. Hot deserts, U.S. Fish and Wildlife Service/Department of Interior, Washington D.C., 1984.

It provides information on the ecology, problems and management of hot deserts. Could be used in developing teaching units on deserts

13. Endagered Species, U.S. Fish and Wildlife Service/Department of Interior, Washington D.C., 1984.

It presents the history, causes and present state of species endangerment. Activity oriented book. A good resource for developing teaching units on endagered species.

14. Freshwater Marsh, U.S. Fish and Wildlife Service/Department of Interior, Washington D.C., 1984.

It presents the freshwater marsh as an important natural resource for plant, animal, and human population, and discusses the ecological problems resulting from the distruction of marshes. Activity oriented book. Good resource on freshwater marsh habitats.

15. Migratory Birds, U.S. Fish and Wildlife Service/Department of Interior, Washington D.C., 1984.

I discusses some of the whys, hows, and whens of bird migration. Activity oriented. Could be used in developing units on migratory birds.

16. Hunting and Wildlife Managment, U.S. Fish and Wildlife Service/ Department of Interior, Wahington D.C., 1984.

It deals with managment of wildlife population and hunting as a tool for wildlife managment. Contains a series of activities on wildlife managment (grades 4-7) which could be used in developing teaching units on simillar subjects.

17. Nature Scope: Birds, Birds, Birds, National Wildlife Federation, Washington D.C., 1985.

This book gives information on birds and outdoor activities to study birds. Activities are universal and could be adopted to the Tunisian situation.

18. Nature Discovery I: Birds, Massachusetts Audubon society, Lincoln, Ma, 1986.

A very good teacher's guide on birds (k-8). Lot of the activities could be adopted to the Tunisian situation.

19. Whaling: The Beginning of the End? Center of Environmental Education.

Background information on whaling.

20. Conserving Soil, National Association of conservation Districts, League City, Tx.

Overview on soils and soil sciences. A good guide on soil ecology. Could serve as a modle for a unit on soil.

21. Sharing Nature With Children, Joseph Cornell, Ananda Publications; 1979, Nevada City, California.

Good activities for young children; includes basic attitude approach for working with children in the out-of-doors.

22. Teaching in the Outdoors, D. and H. Hammerman, Burgess Publishing Company: 1973.

Outdoor education manual, written in the early 70's, is abit dated, but has a valuable basic approach to what environmental education is all about and how one should get started.

23. Nature Study for Conservation, John Brainerd, sponsered by the American Nature Study Society; Macmillan Company, 1971.

Good hadbook for an environment education classroom and understanding of nature - breaks down the study of nature into three divisions: concepts, techiques, and responsibilities.

24. Environmental Education, A Manual for Elementary Educators, B. Robinson and E. Wolfson, Teachers College Press, Columbia University, 1980.

Good text for environmental education elementary teachers, basic understanding and development of curriculum ideas for outdoor education.

25. What Makes Education Environmental? N. McInnis and D. Albrecht, Data Corier, Inc. and Environmental Educators, Inc.; Kentucky, 1975.

an academic approach explaining the theory of environmental education, set up in the form of essays presented by proffessionals in the field.

26. Humanizing Environment Education: A Guide for Leading Nature Activities, C. Knapp and J. Goodman, American Camping Assoc.;1981.

An idea book full of questions and sampling of ideas that might be important to an environment education teacher. Many activities and samplings of dialogue.

27. Outdoor Education: A Manuel for Teaching in Nature's Classroom, Michael Link, Phalarope Books, Prentice-Hall Press, Englewood Cliffs, NJ, 1981.

Good for teachers who want to encorporate environment education into their teaching style, including theories, activities, hints and questions.

28. Nature With Art: Classroom and Outdoor Art Activities With Natural History, Susie Gwen Criswell, Phalarope Books, Prentice-HaLL Press, Englewood Cliffs, N.J., 1986.

An activity book of 53 art activities complimented by 53 nature questions which allow the teacher/naturalist step by step methods of encorporating environment education and art in a teaching day.

29. Nature, Children, and You, P. Goff, Exposition Press, NY; 1974.

29. Cont.

A first hand approach from a naturalist who encourages others to share the world of nature with children. Has some good ideas for teachers.

30. Teaching Children About science: Ideas and Activities Every Teacher and Parent Can Use, Elaine Levenson, Prentice-Hall Science Education Series; Englewood Cliffs, NJ, 1985.

An activity book full of science/nature oriented program. Practical examples.

31. The seaside Naturalist: A Guide to Nature Study at the Seashore, D. Coulombe, Phalarope Series, Prentice-Hall, Englewood Cliffs, NJ, 1984.

A useful manual for trips to the seashore or the study of shore life. Nicely illustrated.

32. Nature With Children of all Ages: Activities and Adventures of the World Around Us, Edith Sisson, Phalarope Books, Englewood Cliffs, NJ, 1982.

A useful book of activities and nature information set up for different grade levels.

33. IIED Anual Report 1985, International Institute for Environment and Development, Washington D.C., 1985.

Background material.

34. Sea Turtle Hachling Disorientation and Artificial Beachfront Lighting, Paurl Raymond, Publishing Center for Environmental Education, Washington D.C., 1984.

Background material on sea turtles. Hatchling orientation and disorientation and the problem of light sources.

35. Tortugas Marinas: Sea Turtles, Center for Environmental Education Washington D.C., 1985.

Good modle for a teaching unit on sea turtles (Spanish and Eng.).

36. Centre for Environmental Education: 1985 Annual Report, Center for Environmental Education, Washington D.C., 1985.
Background material on saving marine species.

37. Environmental Quality: 15th Annual report of the Council on Environmental Quality, A. Alan Hill, William Mills, and Jacquelin Schafer; U.S. Government Printing Office, 1984.
Background material on: pollution control, natural resources, environmental policies, ... etc. A modle for a national environment quality report.

38. Animals in A Grassland, Outdoor Biology Instructional Stratages, Lawrence Hall of Science, University of California: Berkeley Caifornia, 1975.
A modle for a teaching unit - teacher's guide.

39. Habitats of the Pond, Outdoor biology Instructional stratages, Lawrence Hall of Science, University of California: Berkeley California, 1975.
A modle for a teaching unit - teacher's guide.

40. Estuary Guide, Boh Baker, Sally Gucinske, and Katharine Kengor, The Smithsonian Institution: Edgewater, Maryland, 1979.
A good modle for a teaching unit on plants and animals in water or at the water's edge.

41. National Parks and Reserves in the Arabic countries, Arab Leage Publications: Tunis, 1984.
One of the few resources in Arabic on the parks and reserves. Good for developing teaching units on related subjects.

42. Smithsonian Family Learning Project: Science Calander, 1985, Laurie Greenberg, Jamie Harms, Sharon Maves, and Judith Sternfeld, GMG Publishing Corp.: N.Y., N.Y., 1985.
A modle calender with environmental activities and experiments for parents and kids.

43. Global Resource Information Database, John Fanshave, Global Environment Monitoring System, UNEP, 1985.

Background material for educators on: techniques of collecting and analysing environmental data.

44. Islamic Principes for the Conservation of the Natural Environment Abou Baker Ahmed, Sabbagh, Glenid, and Izzidien, Meterorology and Environmental Protection Administratio: Kingdom of Saudi Arabia, 1983.

This paper inlists all the environmental issues that are mentioned in the Ko-ran (the Islamic holly book). It is very important for curriculum planners and ducators working in the Islamic countries.

45. Kuwait Regional Convention for Cooperation on the Protection of the Marine Environment from Pollution, United Nation Environment Program: N.Y., N.Y., 1983.

This report summarizes the out comes of a conference on marine pollution (attended by six Arab countries), For background information only.

46. The Environmental Education in the Arab Countries, Gazi, Abou Shakra, Unesco Regonal Office for Education in the Arab States, 1981.

A report in Arabic. Inlists the importance, objectives, stratiges and methods of environmental education. Good refference for educators.

47. Bibliography of the Marine Environment - Kwait Action plan Region, Food and Agriculture Organization of the United Nations; Rome, 1984.

A bibliography of scientific literature relevant to the environment program of Kuwait Action Plan Region.

48. Ecology: Projects for Young Scientists, Martin J. Gutnik Franklin Waats, Inc.:N.Y., N.Y., 1984.

This book has many activities and experiments in the field of environmental and ecological system, for different grade levels. A good refference for teachers.

49. Trees and Forests, Mohammad Shahur, the Indian Environmental Society: New Delhi

A model teaching unit on trees. Well illustrated. Could be adopted.

50. Conservation Education: A Planning Guide, David Wood, and Diane Wood, Peace corps: Washington D.C., 1985.

Very good manual for nature club leaders and educators. Good resource for developing teaching units on various subjects.

51. Joy of Learning: Handbook of Environmental Education, Center for Environment Education: Government of India, 1986.

Activity oriented textbook, made for the science & math teachers' of India. Some of the activities are very good and could be a componnent of an environment education program.

52. Global 2000 Countdown Kit, Zero population Growth, Inc. Washington D.C., 1982.

It is a population oriented kit. It addresses 14 different subjects that could be projected problems in year 2000, based on present conditions and trends. Activities oriented. Could be a good refference for developing various teaching units.

53. Thinking Globally and Acting Locally: Environmental Education Teaching Activities, the Ohio State University, Columbus, Ohio 1982.

Contain a great number of activities on the following subjects: food, energy, transportation, solid waste, chemical pollutants, resource managment, pollution, population, world linkage, endagered species,.....etc. A very good resource for EE programs.

54. Energy and Land Use, U.S. Department of Energy, Washington D.C., 1981.

A refference book for educators and curriculum planners.

55. Energy and Air Quality, U.S. Department of Energy, Washington D.C

55. Cont.
1981.
A refference book for educators and curriculum planners.

56. Solid/Hazardous Waste, U.S. Department of Energy, Washington D.C., 1981.
A refference book for educators and curriculum planners.

57. Energy and Water Resources, U.S. Department of Energy, Washington D.C., 1981.
A refference book for educators and curriculum planners.

58. World Resources 1986, International Institute for Environment and Development, Basic Boods, Inc.: NY, NY. 1986.

APPENDIX 2

PEOPLE CONTACTED IN THE UNITED STATES

Susi Gwen Criswell, Education Coordinator, Center for Environmental Education, 624, 9th str. NW, Wahington D.C. 20001 (202/737-3600

Carolyn Duckworth, National Wildlife Federation, 8925 Leesburg Pike, Vienna, VA 22184-0001 (703/790-4273)

Jhon H. Falk, President Science Learning Inc., 1310 Harbor Road, Annapolis, MD 21403 (301/268-5149)

Jack Greene, Director Educational Programs Distribution, National Wildlife Federation, 8925 Leesburg Pike, Vienna, VA 22184-0001 (703/790-436)

Maher Abu Jafar, General Director, The Royal Society for the Conservation of Nature, P.Ob 1387 Amman, Jordan (811689)

Joan Martin-Brown, UNEP Representative, Washington D.C.

Edward J. McCrea, Office of International Affairs, U.S. Fish and Wildlife Service/Department of the Interior, Washington D.C. 20240 (202/343-3895)

Roger E. McMans, Center for Environmental Education, 624 9th str. NW, Washington D.C. 20001 (202/737-3600)

June McSwain, Previous Head of Project Learning Tree, 2613 Quincy, Arlington VA 22207 (703/528-0427)

William Mills, The Council on Environmental Quality, 722 Jackson Place, Washington D.C. (202/395-3742)

Anis Moasher, President, The Royal Society for the Consevation of Nature, P.O.B. 138 Amman, Jordan (62407 & 638883)

Nadia Saad, Ex Director of UNEP Regional Office NE, World Bank Loan Officer for Tunisia, The World Band 1818H str. NW, Washington D.C. 20433 (202/473-2428)

APPENDIX 3

II. PERSONS CONTACTED IN TUNISIA

Ministry of Education

Mr. Moktar Bin Ammar	General Director of the Ministry of Education and Scientific Research, Representative of the Ministry in the National Board for Environment. Tunis: 660787 (telephone)
Mr. Mahmoud Shoushan	Director of Elementary Education, Ministry of Education. Tunis: 660632
Mr. Mohamed Al Habebe Oun	Director of Educational Projects, Ministry of Education. Tunis: 660567
Mr. Mohamed Al Habebe Hanafi	Director of Elementary Education, Ministry of Education, Baja Governorate Baja: 0851152
Mr. Hamadi Al Kar	Director of Teacher Training Institutes, Ministry of Education. Tunis: 660672
Mr. Abdul Karim Al Wislati	Director of the Elementary School of Skhira, Ministry of Education Baja Governorate

Prime Minister's Office

Dr. Mustafa Mounief	General Director of the Board of Environment, Office of the Prime Minister Ex-under Secretary for the Prime Minister Tunis: 263439

Tunisian Institute for Appropriate Technology

Mr. Cherif Zaouch	President and Founder of the TIAT. 88 Avenue Bourgiba, Carthage. Tunis: 275572
Dr. Zouhair Kallal	Director of the National Institute of Nutrition, Bab Saadoun- Tunis. Board member of TIAT. Tunis:

Dr. Mohamed Farhat	Agrège en Medecine, Specialite Chirurgie Hergla 4012. Board member of TIAT.
Mrs. Jamila Binous	Coordinator of Research in the Madina Association. Board member of TIAT Tunis: 263561
Dr. Hachemi Hamza	Director of the National Institute of Forestry, Route de la Soukra - Tunis Board member of TIAT
Mr. Mohsen Ouelhaze	Program Supply/Assistant, UNICEF, Tunisia. A member of the Board

AID Mission

Mr. Mark Karans	Mission Environmental Officer. Tunis. 784300

U.N.D.P.

Mr. Kess Wignen	Assistant Representative, UNDP, Tunis. Tunis : 264011

Arab League

Dr. Ahmed Al Haj Sa'id	Assistant General Director, Organization for Culture, Education, and Sciences (Elexo). Tunis: 781875
Dr. Farouk Al Jerabi	General Director for Health and Environment, The Arab League, Tunisia. Tunis: 890100 ext. 310

French Experts (visiting TIAT)

Mr. Robert Norez	Center d'Application et de Promotion des Energia Nowelles Ecologigues (C.A.P.E.N.E), Nontpellier, France. France: 67.64.40.62. (Specialist in organic farming)
Mr. Hubert de Pourquery	Pare'sous - 04200, Sisteron France: 92.61.07.79. (Specialist in small agro-industrial technology)

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APPENDIX 4

TIAT BOARD MEMBERS

M. Farouk BEN MILED

Né le 7 septembre 1936, Tunis
Architecte DPLG
6, rue de Madagascar, Tunis

Mme Jamila BINOUS

Née le 23 février 1939, Tunis
Licence d'Histoire
Coordinatrice des Etudes à l'Association
de Sauvegarde de la Médina de Tunis
24, rue du Tribunal, Tunis

M. Hédi BOUBAKER

Né le 25 juin 1920, Tunis
Ingénieur Principal sur concours d'Etat
Sous-Directeur d'Administration Centrale,
Ministère de l'Equipement et de l'Habitat
Avenue de la République, Tunis

M. Mounir BOURAOUI

Né le 29 avril 1951, Sousse
Licence en droit des affaires
Maîtrise en droit international public
Diplomé d'Etude approfondie en droit économique International
du Développement
Boulevard de Rabat, Cité CNRPS, Apt 213, Bloc 2, Sousse

Dr. Mohamed FARHAT

Né le 12 octobre 1928, Tunis
Agrégé en médecine, Spécialité chirurgien
Hergla 4012

M. Amara GHRAB

Né le 31 janvier 1945, Zarzis
Architecte DPLG, urbaniste
Professeur enseignant à l'ITAAU
2, impasse Dabbagh, Sidi Bou Saïd

Maître. Mohamed HAMOUDA

Né le 27 novembre 1953, Tunis
Licence en Droit
D.E.S. Droit Privé
Avocat au Bareau de Tunis
31bis, rue Sidi Ben Arous - Tunis

M. Hachemi HAMZA

Né le 15 juin 1932, Mahdia
Licence Sciences Naturelles
Diplomé de l'Ecole Nationale des Eaux et Forêts, Nancy
Ingénieur Général
Directeur de l'Institut National de Recherche Forestière
Route de la Soukra - Tunis

Dr. Zouhaïr KALLAL

Né le 24 février 1930, Tunis
Agrégé de Médecine
Directeur-Fondateur de l'Institut National de Nutrition et Technologie Alimentaire
Professeur à la Faculté de Médecine de Tunis
Rue Aristide Briant, Bab Sâadoun - Tunis

M. Mondher KHALLED

Né le 10 juin 1952, Medjez El Bab
Diplômé de Recherche Approfondie en géographie rurale
Administrateur des Programmes UNICEF, Tunis
2, avenue de l'Afrique - El-Menzah V

M. Mohsen OUELHAZI

Né le 16 novembre 1950, Skhira
Etudes de 3e cycle - Histoire
Diplôme Etudes Supérieures / Gestion (Tunis)
Programme Supply/Assistant, Unicef
2, avenue de l'Afrique - El-Menzah V

M. Chérif ZAOUCH

Né le 15 novembre 1939, Tunis
Licence en Philosophie
Président Fondateur de l'Institut Tunisien de Technologie Appropriée
Sidi Bou Ali 4040, Tunisie

APPENDIX 5

COMMITTEE MEMBERS IN SKHIRA REGION

1. Un comité de coordination constitué par douze paysans , membres de la communauté de Skhira et Ouled ayar :

1) Ahmed Ben Mohamed Salah Bel Meddeb Ouelhazi

2) Hassine Ben Boubaker Ben Hadda Ouelhazi

3) Hassine Ben Slimene Ben Ali Ouelhazi

4) Lazhar Ben Alaya Ouelhazi

5) Mokhtar Ben Mokaddem Ben El Haj Amara Ouelhazi

6) Mohamed Ben Ahmed Ben Mahmoud Ouelhazi

7) Mohamed Ben Dhiaf . Mzoughi

8) Mahamed Salah Meknassi

10) Noureddine Ben Mokhtar Ouelhazi

11) Sadok Ayari

12) Taieb Bel Hadj Amara Ouelhazi

Appendix 6

A Model Teaching Unit in Environmental Education
(Could be used as a guide in developing the Tunisian Env. Curriculum)

Grade I

Unit	Content	Educational Concepts	Educational Objectives
1. Man and his Environment	- School cleanliness: The people who clean our school. How do we help in cleaning and keeping the school clean? - Order and quietness at school. How do we help keep our school quiet? - How can we help keep order at our school? - Importance of water in our daily life. - Effect of noise on our health.	- Keeping the school clean is the responsibility of each - Keeping the school quiet is the responsibility of each student. - Water plays an important role in our daily life.	- Knows who keeps the school clean. - Understands his role in keeping the school clean - Helps keep his school clean (picks up litter, keeps lavatories and wash-room clean). - Knows the uses of water in cleanliness. - Knows the bad effects of noise on health.

Grade II

1. Man and his Environment	- The clean house. - The quiet house. - The beautiful house. - Water conservation.	- Keeping the house clean and quiet is the responsibility of all family members. - Keeping the house neat and beautiful is the responsibility of all family members.	- Knows his role in keeping his home clean. - Knows his role in keeping his home neat and tidy. -- Knows his role in keeping his home quiet. - Knows the bad efficts of not keeping the house clean and quiet. -- Knows the means to conserve water - at home. - Knows the importance of water in cleanliness.

Appendix 6 cont.

Grade III

Unit	Content	Educational Concepts	Educational Objectives
1. Man and his Environment	- Definition of environment. - Importance of environment. - The health environment.	- The air, water, plants, plains, buildings, trees ...and neighborhooe are all a of our environment. - The environment effects us in many ways. - We are all responsible for for improving our environment.	- Understands the meaning of "enviro.. ment." - Understands that his home and school are a small part of his environment. - Knows the relationship between man and his environment. - Knows his role in preserving his environment (mainly the school and home).

Grade IV

1. Man and his Environment.	- Importance and uses of water in the home. - Water pollution. - Sea and river pollution. - Problems of polluted water. - Fighting water pollution.	- Water is a necessity of life. - Conserving water is the responsibility of all of us. - Water pollution may endager our lives. - Fighting water pollution is the responsibility of every one of us.	- Understands the importance of water to man. - Understands the importance of water in agriculture and in industry. - Lists reasons for pollution of seas, rivers and wells. - Knows his role in helping fight water pollution.

Appendix 6 cont.

Grade V

Unit	Content	Educational Concepts	Educational Objectives
1. Man and his Environment	- Importance of air to animals and plants. - Causes of air pollution. - Fighting air pollution.	- Air is essential to life. - Smoke, dust cars, and factories may cause air pollution. - Polluted air is dangerous to human life. - Keeping the air clean is the responsibility of everyone.	- Understands the importance of of air to life. - Lists the causes of air poolution. - Understands the dangers of air pollution. - Lists the ways to fight air pollution. - Understands his role in fighting air pollution.

Grade VI

1. Man and his Environment	- Noise pollution and its dangers - Liquid and solid wastes and their pollutant dangers. - Factory pollutants and their dangers.	- Noise pollution may be dangerous to our health. - We can help fight noise pollution. - Liquid and solid waste products may add to the problem of pollution. - We can help fight pollution	- Understands the health problems of noise pollution. - Lists the pollution problems that may result from liquid and solid wastes. - Understands his role in fighting waste products pollution. - Understands some of the laws and regulations to prevent the pollution resulting from factories

Appendix 7

Contents of Elementary curriculum - Evironmet related

برنامج المرحلة الابتدائية - المواد المتعلقة بالتربية البيئية الموجودة حالياً

السنة الاولى Grade I	السنة الثانية Grade II	السنة الثالثة Grade III	السنة الرابعة Grade IV	السنة الخامسة Grade V	السنة السادسة Grade VI
١- الوسط الجغرافي والايقاظ العلمي : - جمع اوراق اشجار وزهور - فوائد الشجرة - تغيرات الطقس - تغذية النبات - تربية بعض الحيوانات في المدرسة (حمام الزينة) - زراعة بعض البذور في حديقة المدرسة - مراقبة نمو الحيوانات والنباتات - تصنيف الحيوانات	① الوسط الجغرافي والايقاظ العلمي : - الماء الصالح للشرب - وقاية المياه من التلوث - ضرورة تعقيم المياه في الريف - تأثير الفصول على النبات - قياس طول ساق النبات لتتبع تطور نموها - تربية زوج من الحيوانات ذكر وانثى - الاعتماد على التجربة الشخصية في الوسط الريفي - تصنيف الحيوانات حسب كيفية تكاثرها - حياة النبات - تعليم الطفل حماية البيئة	① الوسط الجغرافي والايقاظ العلمي : - تربية حيوانات للملاحظة الاغذية التي تعيش عليها - زراعة النباتات - تصنيف الحيوانات حسب الوسط الذي تعيش فيه (الضفدع كمثال لحيوان يعيش في وسطين) - بحوث حول الحيوانات المنقرضة او التي هي في طريق الانقراض - الحيوانات في الوسط المحلي - النباتات في الوسط المحلي - الحياة في الغابات - احترام الاشجار - المحيط الطبيعي	① الوسط الجغرافي والايقاظ العلمي : - كيف يحصل الحيوان على الغذاء - تصنيف الحيوانات حسب كيفية تنقلها - ملاحظة النبات في الوسط الريفي - غرس الاشجار - دور الغابات في توفير الغذاء وتزويد المحيط بالاوكسجين - الاقبال على التشجير لمقاومة الانجراف - الري في الوسط المحلي - الضيعة الصغيرة وطرق استثمارها - تربية المواشي والدواجن - الجفاف ومقاومته - آفات الزراعة في الوسط المحلي - الغابات	① الوسط الجغرافي والايقاظ العلمي - تربية حيوان اوطير لاكتشاف اهم الوظائف - اجراء تجارب تثبت ان النبته تتنفس - دور النبات في توفير الغذاء وتصفية الهواء في البيئة - زيارة غابة او غدير - تكوين مزرعة مائي او تربي خضري - مفهوم التوازن البيئي	① الوسط الجغرافي والايقاظ العلمي : - بحوث حول الوسائل العلمية لمقاومة التلوث الجرثومي - القيام بتجارب حول الترقيد والتطعيم

Appendix 7 cont.

Contents of Elementary School Curriculum – Env. Related Subjects

برنامج المرحلة الابتدائية – المواد المتعلقة بالبيئة الموجودة حالياً

السنة الاولى Grade I	السنة الثانية Grade II	السنة الثالثة Grade III	السنة الرابعة Grade IV	السنة الخامسة Grade V	السنة السادسة Grade VI
② اللغة العربية: - النظافة اليومية - الطفل في المدرسة، المنزل في الشارع والسوق - مظاهر الطبيعة: الخريف، الشتاء، الربيع	② اللغة العربية - الحياة في الخريف: مع الصياد، مع الحراث، مع اوراق الخريف، المطر - مكتبة حب الوطن - الربيع: النزهة، الازهار، الطيور، الحيوانات	③ اللغة العربية - حياة بعض الحيوانات الاليفة وعلاقتها بالانسان	② اللغة العربية: - نصوص تعالج جوانب من حياة الطفل في بيئته - نصوص تدرس بالمناسبة تتناول المواسم - قصص طريفة تتصل بعالم الحيوان والانسان	② اللغة العربية: - نصوص تصور نماذج من الحياة العاملة حسب الفصول وتبرز التكامل بين مجهودات الانسان في تلك الاوساط - نصوص تبرز عناية الانسان بخدمة الارض - ايات العلم والتكنولوجيا - قصص تصور حياة الحيوانات الوحشية	② اللغة العربية: - قصص عن النزوح والتسكع (اسباب) - الكوارث الطبيعية
③ التربية الاسلامية والاجتماعية: - النظافة	③ التربية الاسلامية والاجتماعية: - الرفق بالحيوان - مظاهر نعم الله	③ التربية الاسلامية والاجتماعية:	③ التربية الاسلامية والاجتماعية - محبة النبات - مظاهر الكون - العمل الفلاحي	③ التربية الاسلامية والاجتماعية: - التمتع بالطيبات - احترام النبات والحيوان - السكان وتزايدهم - النزوح الى المدن	③ التربية الاسلامية والاجتماعية: - مشاكل العاصمة - السياحة - الفلاحة ومشاكلها - السكان وتزايدهم

APPENDIX 8

The Contents of Environmental Education in the Curriculum of the Tunisian Teacher Training Institutes

Subject	First year program	second year program	Third year program	Fourth year program
Arabic-Reading Material			Progress and its problems over population, housing immigration , pollution.	Man and the control of nature.
	* Development and environment.	* Interaction of culture and environment.		
Physical Sciences				
	* Energy and its conservation	* Dangers of nuclear radiation	* Solar energy and its applications	* Industrial pollution

Subject	First year program	Second year program	Third year program	Fourth year program
Islamic Studies	———	———	———	———
	* The understanding of conservation according to the Koran	* The understanding of environment in the Koran	* Working towards a better environment - the Koran point of view	* The balance between man and his environment as mentioned in the Koran
Natural Sciences	-Plants and environment - The effect of environment on living organisms - Weather and plants - The soil and plants - Water and plants	- Animals and environment - The relation between environment and its habitats - Study of fish, birds and insects - Protecting our environment - The ecosystem - Pollution problems - endangered species	———	———

Subject	First year program	Second year program	Third year program	Fourth year program
History and Geography	- Population - Problems of overpopulation - Migration and its effects - Agricultural life - Industrial life - Large cities	———	———	- Weather - Agriculture and fisheries - Industries
		-*The relation between development and environment -*Importance of environment to man	-*Integrated rural development - Tourisim and environment	
Arts	Utilize the art class to consider the main environmental issues of Tunisia: desrtification, erosion, deforestation, pollution, beautiful environment, ...etc.			
Clubs Activities	Out of the 16 clubs listed for the activities program of the institutes, none deals with environment. TIAT would like to add an environmental club to each of the teacher training institutes. The main activities of such a club may be: field trips, film show, exhibitions, studies and research, wall newspaper, talks and discussions, corresponding with other clubs, environmental action projects (planting trees, cleanliness campaigns, gardening, campus projects, ... etc. For details on the suggested club (objectives, organization, and program) see App. 4.			

Appendix 9

Specifications of Supplies and Equipment Requested for the Audio-Visual Unit

Item	Description	Commodity code	Qty	Price (US $)
1	Projector 16 mm optical multi-volt 50/60 HZ 20 W	UNIPAC 1800660	1	908.35
2	Lamp replacement for projector 1800660 multvolt	UNIPAC 1800665	10	106.40
3	Spare parts for projctor 1800660 (HT)	UNIPAC 1800670	1	67.63
4	Screen projction portable 1.80 m x 2.44 m	UNIPAC 1810400	1	130.50
5	Stand for projector portable Aluminuim	UNIPAC 1810700	1	85.00
6	Voltage regulator 1500 W 170-270 imput 220 V output	UNIPAC 1811835	1	201.14
7	Extension - cord electric 25-30 m	UNIPAC 1822000	1	19.20
8	Portable VHS video recorder convertors VCBL/B/B & ACBL/P/P	UNIPAC 189	1	450.00
9	Portable video-camera, Pal system National WV 3110	UNIPAC 189	1	650.00
10	Video Hifi table W 0.66m , h 0.61m, d 0.43m	Osterman 304.5	1	107.00
11	VHS home/portable video recorder VC, timer, 3ways power, ...etc	Osterman A:801-4223	1	685.00
12	Shoulder bag, VR, 330 SB for Video recorder VC 3300	Osterman A:8014239	1	37.15
13	26" Colour T.V., T 66-240 CT's System 1-2-3 and 9 .....etc.	Osterman E: 8015405	1	603.00
14	UHF TV Antenna, channels 21-60	Osterman G:8040485	1	69.25

Item	Description	Commodity code	Qty	Price (US $)
15	Universa TV amplifier with AC adaptar for mask.	Osterman H:8040498	1	59.00
16	Mounting set for 3-3.8 cm adjustable from 35-58 cm.	Osterman I:8040540	1	18.50
17	Expansion balts, 10x90mm box of 8 pcs.	Osterman K:8040549	1	18.45
18	Chimney - mounting set for 3-3.8 cm , box of 8 pcs.	Osterman K:8040566	1	26.25
19	Cable 7mm for radio and TV antennas 25m.	Osterman L:8040585	1	15.45
20	Cable holders, for 7mm cable, clear pox of 100 psc.	Osterman N:8040599	1	2.01
21	Extra long cord for TV, radio, video, lamps etc. 3m	Osterman D:8059357	1	2.75
22	Plug terminal	Osterman D:8059323	2	4.18
23	Connection cable	Osterman B:8059311	2	6.92
24	AC plug - standard outlet	Osterman B:8059340	2	1.00
25	Video copying cable	C:8059316	1	8.89
26	Video tek, 5 boxes	A:8059557	10	6.17
27	VHS Blank cassettes	UNIPAC 189	25	150.00
28	Complete H i f i system, with amplifier, digital ...etc.	Osterman 8550983	1	600.00
29	Optional equipment and accessories for H i f i system Stereo system K 1250 Midi stereo stack system 1652	Osterman 8550992 A:8551295 B:8551272	1 1 1	281.00 141.00 255.00
30	CA-WAD double cassette recorder	UNIPAC 189	1	212.00
31	Head phone dynamic frequency connection cord	Osterman J:8157957	1	27.00

Item	Description	Commodity code	Qty	Price (US $)
32	Sony walkmann Professionnel WM-BGC recorder	UNIPAC 189	1	305.00
33	Zero Malleb. (big size)	UNIPAC 189	1	110.00
34	Nikon FA 35 mm	UNIPAC 189	1	440.00
35	Moter drive for Nikon FA	UNIPAC 189	1	135.00
36	Nikkor 28 mm Zoom lens wide angle	UNIPAC 189	1	175.00
37	Mikkor 80-200 mm zoom lens	UNIPAC 189	1	450.00
38	Flash electronic Sun 522 with charger 3100 AC and batteries	UNIPAC 189	1	350.00
39	Caronsel SAV slide projector Kodak W - zoom lens	UNIPAC 189	1	565.00
40	Kodak caronsel trays	UNIPAC 189	20	300.00
41	Copier 7400 Sharp with kit	Sharp	1	4,932.00
42	Typewriter Xerox 610	Xerox	1	750.00
43	Overhead projector		1	250.00
44	Table lamps		20	300.00
45	Black sheltes:20 m		1set	60.00
46	Chairs (wood)		100	300.00
47	Black-board		2	75.00
48	Functionnal wood tables		25	600.00
				9,682.00

Program support materials & equipment

Stoves, gloves , blender, measuring cups, lanterns, scale, microscope, refrigerator, ...etc. at a cost of US$ 1,986.99

Total coast 11,668.99

* For details see original list (hand written).

908•35 +
106•40 +
67•63 +
130•50 +
85•00 +
201•14 +
19•20 +
450•00 +
650•00 +
107•00 +
685•00 +
37•15 +
603•00 +
69•25 +
59•00 +
18•50 +
18•45 +
26•25 +
15•45 +
2•01 +
2•75 +
4•18 +
6•92 +
1•00 +
8•89 +
6•17 +
150•00 +
600•00 +
281•00 +
141•00 +
255•00 +
212•00 +
27•00 +
305•00 +
110•00 +
440•00 +
135•00 +
175•00 +
450•00 +
350•00 +
565•00 +
300•00 +
4932•00 +
750•00 +
250•00 +
300•00 +
60•00 +
300•00 +
75•00 +
600•00 +
1986•99 +
1986•99 +

1986•99 -
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E. Time Table

	1st year (1987/88) Jan. - March	April-June	July-Sept	Oct.-Dec	2nd year	3rd	4th	5th	6th	7th	8th
1. Secure MOE approval	x										
2. Inform IIED	x										
3. Build media room	xx	xxx									
4. Peace corps volunteer		xxxxxxxxxx	xxxxxxxxxxxx	xxxxxxxxxx	xxxxxxxxx						
5. Teacher training		xxx									
6. Build workshops			xxxxxxxxxxxxx								
7. Plan environment curr.			xxxxxxxxxxxxx								
8. Entroduce env. program				xxxxxxxxx	xxxxxxxxx	xxxxx	xxxxxx	xxxxx	xxxxx	xxxxx	xxxxxxxx
9. Build env. center				xxxx	xxxx						
10. Open env. center					x						
11. Evaluate		xxxxx	xxxxxxxxxxxx	xxxxxxxxxx	xxxxxxxxx	xxxxx	xxxxxx	xxxxx	xxxxx	xxxxx	xxxxxxxx
12. Test curr. & materials			xxxxxxxxxxxx	xxxxxxxxxx	xxxxxxxxx	xxxxx	xxxxxx	xxxxx	xxxxx	xxxxx	xxxxxxxx
13. Expand the program						xxxxx	xxxxxx	xxxxx	xxxxx	xxxxx	xxxxxxxx
14. open new env. centers							x		x		x