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Jordan
Global Learning to Benefit the
Environment (GLOBE):
Linking Students, Teachers and the Environment

GreenCOM Final Report



GreenCOM
the
human
nature project

December 1998
Academy for Educational Development
1255 23rd St. N.W.
Washington, D.C. 20037

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**GreenCOM Summary Report
Jordan GLOBE Delivery Order**

PCE-Q-00-93-00069-00 Task Order 21

Submitted: December 10, 1998

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EXECUTIVE SUMMARY

GreenCOM/GLOBE/Jordan was a highly successful program because of the technical contributions of Ms Khulood Tubaishat (GreenCOM's GLOBE advisor), the efforts of a team of volunteers from the Friends of the Environment Society (FOES), and the dedication of GLOBE instructors throughout the country. Management of the project sustained several pitfalls, and sustainability seemed problematic. GreenCOM/Washington feels that its GLOBE startup activities broadened minds of Jordan's next generation. GLOBE itself is a challenging, creative opportunity for students to learn about the Earth. GreenCOM recommends that every adolescent in the region participate.

ACTIVITIES AND RESULTS

Project Startup

In early July 1997, Mona Greiser, GreenCOM's Senior EE & C Specialist, traveled to Amman, Jordan to meet with the national coordinator of GLOBE in Jordan, Raouf Dabbas, and to recruit a GLOBE advisor to GreenCOM, who would work with the GreenCOM home office to coordinate the program in the field. She interviewed Khulood Tubaishat, who had worked for GreenCOM before and had background in EE & C. Ms Greiser also met with volunteers from Friends of the Environment Society (FOES), an NGO headed by Mr Dabbas. Ms Tubaishat agreed to work with Mr Dabbas and FOES volunteers, and FOES agreed to make arrangements for a regional GLOBE workshop later that summer.

While AED/GreenCOM/Washington contracted Khulood Tubaishat, Martha Monroe, director of GreenCOM's resource center and an expert in GLOBE protocols, traveled to Amman to conduct an introductory GLOBE workshop for volunteers of FOES and 24 secondary school teachers charged with implementing GLOBE in Jordan. (The workshop that GLOBE intended to hold in Jordan for neighboring countries was canceled for political reasons.) Dr Monroe purchased chemicals necessary to operate GLOBE equipment, unpacked the scientific equipment ordered by GreenCOM/Washington staff, demonstrated GLOBE protocols to an enthusiastic audience, and encouraged the teachers as they experimented in reporting measurements to GLOBE's website. In cooperation with Ms Tubaishat, she began to draft the workplan and discussed sustainability with US Embassy staff. Despite the difficulty of GLOBE concepts and a language barrier, volunteers and teachers grasped the protocols and were anxious to work together to teach GLOBE, establish Internet connections, and raise funds for the future. The revised, April 1998 workplan is attached to the end of this report.

Computer and Scientific Equipment Procurement

Back in Washington, Peggy Preusch, a GreenCOM logistics specialist, shipped six Academy for Educational Development (AED) computers to FOES for distribution to the six

GreenCOM-sponsored GLOBE schools She also purchased six GLOBE 97 Advanced Kits from Scientific Technology, a Maryland firm Use of state-of-the-art AED computers saved project money that was used to send Mr Dabbas and Ms Tubaishat to Miami, Florida for further training at an international GLOBE workshop in November 1997 They returned via Washington, DC to meet with US NGOs to learn fundraising strategies for sustaining GLOBE in Jordan The remaining money saved was earmarked by FOES and GreenCOM for purchase of additional GLOBE kits to support non-GreenCOM GLOBE schools in Jordan

FOES installed the six computers in the following six schools

- Raya Bint Al-Hussain (Mafrq)
- Malka Secondary School for Boys (Malka - Irbid)
- Mu addi Secondary School for Boys (Dar Allah)
- Am Al-Baida School (Tafilah)
- Salman Al-Farsi School for Boys (Aqaba)
- Prince Faisal the 1st School

Ten other schools signed up, including the following institutions

- National Orthodox School (Amman)
- Rawdat Al-Ma arif Schools and College (Amman)
- Fatima Al-Zahra Military School (Amman)
- Al-Thawra Al- Arabiya Al-Kubra Military School (Zarqa)
- Salt Pioneer Center for Gifted Students (Salt)
- Irbid Pioneer Center for Gifted Students (Irbid)
- Al-Hussain School for Girls (Amman)
- Al-Karak Pioneer Center for Gifted Students (Al-Karak)
- Gharandal Secondary School for Boys (Gharandal - Tafilah)
- Al-Sarh School for Boys (Aqaba)

Sixteen schools shared the six GreenCOM-provided kits, and FOES guaranteed Internet access to all GLOBE sites covered the width and breadth of Jordan, including boys' and girls', rural and urban, regular and gifted, and poor and wealthy schools The teachers and volunteers cooperated admirably despite a shortage of supplies and only fair Internet access in Jordan generally

Training in Globe Protocols

Under contract by GreenCOM/Washington, FOES agreed to coordinate two workshops on GLOBE protocols They were required to submit narrative reports to Washington (Ms Tubaishat was responsible for filing other project-related expense reports)

Introductory Three-Day GLOBE Training Workshop (August 2-4, 1997)

The workshop was held at Al-Ma arif School in Amman and was facilitated by Martha Monroe. Sixteen schools sent two representatives each, a science teacher and a computer instructor. Other attendees included Mowafaq Abu-Ghasleh, a scientist at the Ministry of Education, and Omar Hamarneh, a computer specialist and a member of FOES.

The workshop enabled teachers and FOES to launch GLOBE activities at the beginning of the 1997 academic year. Teachers learned how to conduct measurements according to GLOBE protocols for atmosphere, hydrology, GPS, biometry and land cover. They became familiar with the Internet and equipment calibration methods. In addition to short lectures, trainees trooped outdoors to measure a variety of parameters, such as tree height, rainfall, and canopy density. There was a field trip to Wadi Al-Seer to create a land cover plot and to collect water samples. Every school was asked to submit a 1997 GLOBE workplan. The final ceremony was covered by JTV and local newspapers.

International GLOBE Training Workshop (November 17-21, 1997)

GreenCOM used money saved from computer procurement to send Mr. Dabbas and Ms. Tubaishat to an international GLOBE workshop in Miami, Florida. They learned new GLOBE science protocols and learning activities, which GLOBE had introduced in Summer 1997. They practiced measuring environmental phenomena, reporting GLOBE data, using GLOBE educational materials and communicating via the Internet and the GLOBE website. Mr. Dabbas and Ms. Tubaishat attended primarily to learn soil protocols, which Dr. Monroe had been unable to cover that summer.

GLOBE Student Training Workshop (March 31 - April 2, 1998)

The second workshop targeted students in addition to teachers. Twenty-nine teachers and 56 students attended representing all 16 schools. This workshop was sponsored by a number of organizations, including the Greater Amman Municipality, the Deputy Mayor of Amman, Global One-Sprint/Jordan, the Ministry of Youth and Culture, The British Council/Jordan, Mrs. Nawal Abu Rumaila (a private citizen), Jordan University, the Royal Scientific Society/Computer Center, and the Ministry of Education.

There were three objectives. Students covered GLOBE protocols and learned the value of teamwork and communications through the Internet. Teachers reviewed GLOBE methods. Attendees focused on hydrology and land cover, visited the Meteorological Department, and participated in a GLOBE international chat session on remote sensing. Students learned how to analyze GLOBE data and how to read contour maps. On the last day, each school chose six GLOBE partner countries. Several dinners, a quiz night, and group work accentuated the program. Certificates were awarded on the last day, as they had been at the end of the first workshop. The second workshop was also covered by broadcast and print media.

On-going Support

Khulood Tubaishat, Omar Hamarneh, Zeina Othman, and Ahmed Daghestani formed a GLOBE team within FOES. Together they had vast environmental and computer knowledge. They visited, on average, two schools a week to review GLOBE, fix computer hardware, and tutor teachers and students on the Internet. They also held monthly meetings at FOES headquarters to review teachers' monthly reports, exchange ideas, and discuss problems. Using FOES computers, they sent data to GLOBE's website and participated in GLOBE chat sessions. In November 1997, they presented Malka School for Boys with an award because it was the first Jordanian school to submit data to GLOBE.

Teachers helped plan the second workshop for students. In February 1998, all teachers and students traveled to Al-Mu'adib School for a program on war and the environment. The mayor, the governor, members of parliament, parents, and journalists attended. Ms. Tubaishat worked very hard to establish contacts within the scientific community in Jordan.

In April, when the FOES/GLOBE team disintegrated, Ms. Tubaishat and Mr. Dabbas agreed that GLOBE teachers should form a committee that would administer the program within FOES. Ms. Tubaishat trained the teachers during weekly meetings, so they would be fully prepared when her GreenCOM contract expired in Fall 1998. They wrote bylaws and elected a board.

Student and Teacher Testimonials

Through the Internet and during visits to Jordan by GreenCOM/Washington and USAID/Washington staff, visitors heard reports of tremendous progress. Students and teachers praised the hands-on scientific opportunities afforded by GLOBE and marveled at the miracle of the Internet. Adults and youth were equally enthusiastic and learned almost simultaneously. Teamwork, Internet connections with students and scientists worldwide, measuring environmental phenomena outside, learning about the dangers of pollution, and claiming responsibility for a healthy, sustainable global environment made GLOBE unusual. Everyone also enjoyed the opportunity to improve his/her English while mastering challenging scientific skills.

The most exemplary school during GreenCOM/GLOBE/Jordan was the Salt Pioneer Center, an after-hours program for gifted Jordanian students in the Salt-Amman area. Maisa' Haddad, an English teacher trained in GLOBE protocols, administered the program to 33 boys and girls. By early October 1998, her students had submitted 1102 data reports to the GLOBE website, more than any other school in Jordan or neighboring Israel. The young women were particularly talkative the day Mary Sebold visited from GreenCOM/Washington. One commented that "it is important to know our environmental problems and think about ways to solve them for Salt, Jordan and the Arab World. [GLOBE] has pushed me to keep my

environment [clean] at home and on my street " One young woman said that her mother had tired of her constant talk about GLOBE until she saw her child on television! The class planned to visit a nearby cement factory to present some of their findings and discuss the dangers of air pollution with the owners A teacher from one of the other 16 GLOBE schools in Jordan observed that his students now worked in the greenhouses with more knowledge of chemicals and that they hoped to communicate with Moldova on an agricultural project GLOBE was more like a hobby than classwork Everyone wanted to be a scientist (See Attachments for additional testimonials)

Sustainability

As with any international development project, sustainability of worthwhile efforts presents the greatest challenge GLOBE addressed sustainability and local ownership by asking the Government of Jordan to name a national coordinator/NGO (Raouf Dabbas and FOES) Because GreenCOM hired a professional schooled in environmental education (Khulood Tubaishat), it promoted local ownership of GLOBE and advanced the cause of women in science By encouraging cooperation among teachers from very different social backgrounds and by gradually relinquishing technical responsibility to them, GLOBE became a much more permanent, Jordanian-based program The teachers do not wish to see GLOBE disappear

Raising funds from the private sector seemed to be a relatively new concept Apart from networking in Jordan, at times with great success, Mr Dabbas and Ms Tubaishat had little experience in fundraising Over time, schools needed new scientific equipment, replacement chemicals, and updated hard- and software At the request of the US ambassador to Jordan and with funds saved, GreenCOM/Washington organized a three-day program (November 24-26, 1997) on fundraising for Dabbas and Tubaishat after the Miami GLOBE workshop Washington staff organized visits to small and large NGOs, US government agencies, and fundraising organizations The two guests were given a number of publications by grant-giving departments of major US corporations Unfortunately, the schedule was not followed completely, Mr Dabbas and Ms Tubaishat could not find the Foundation Center which GreenCOM/Washington felt would introduce them to US fundraising They did visit the Peace Corps, which has assigned volunteers to FOES

There is little money forthcoming from the Government of Jordan and none from the US Government Beyond in-kind and occasional financial donations from private citizens, family contacts, and academic institutions, the body that coordinates GLOBE, at the moment FOES, must pay much more attention to raising funds Ms Tubaishat began writing fundraising letters in February 1998 She proposed an Adopt-a-School program to representatives from parliament Three schools were adopted Mr Dabbas asked wealthy GLOBE schools to adopt poor ones These arrangements, modified versions of GLOBE's adoption program by private-sector companies, seem tenuous at best

GreenCOM tried its best to encourage sustainability while concentrating on the technical

side of GLOBE At the end of the project, GreenCOM/Washington shipped information on US environmental organizations and Foundation Center publications to the teachers, information it had shared with FOES and Ms Tubaishat previously Washington staff also made sure that all parties had contact information on the companies that supplied GreenCOM with scientific equipment Thus, GreenCOM planted seeds and spread others that with good leadership will grow

LIMITATIONS AND PROBLEMS

Personnel

For a project with such a small budget and limited time frame, GreenCOM/GLOBE/Jordan experienced confusion and, at times, disagreements among project staff Fortunately, this did not prevent outstanding achievements by students or dampen student or teacher enthusiasm for the program

Initially, in Washington, GreenCOM had some difficulty assigning roles and communicating with project staff Who was responsible for technical work? Who was responsible for administrative work? Who should produce the workplan? Eventually, these problems were solved, and GreenCOM produced a very effective modification to the delivery order and project budget and, subsequently, a revised workplan that answered Jordanian and US Government concerns (See Attachments)

Throughout the project, teachers, FOES volunteers, and Washington staff encountered difficulties with the Jordanian-designated national GLOBE coordinator, the president of FOES Mr Dabbas did not understand the differences between GLOBE, GreenCOM, and USAID or that GreenCOM was responsible for only six of the sixteen schools His professional relationship with GreenCOM's GLOBE advisor, Ms Tubaishat, never good, completely deteriorated by the end of the project He did not respect her hard work and, at one point, claimed not to have known that GreenCOM had hired her He also alienated the only paid member of the FOES staff (Ahmad Daghestani), one member of the FOES/GLOBE team He abused GreenCOM/Washington's former logistics administrator, Peggy Preusch, causing her almost to wreck her car while transporting him and Ms Tubaishat to a meeting at NASA during their Washington trip He complained about travel arrangements and meetings before and after his visit and demanded that Ms Preusch be removed from the project GreenCOM complied His manner was, in the view of all of these people, very arrogant

Worse, his handling of Jordanian GLOBE teachers was poor FOES involvement was self-serving, they felt Mr Dabbas did not wish to be involved personally in advising teachers technically or in seeing that their Internet bills were paid At the end of the project, a group of GLOBE instructors cited numerous examples of his ill treatment of them Funds, raised by the teachers to underwrite a GLOBE trip to Finland, were rumored to have been used for personal

FOES travel. The teachers had held a competition, which a young woman won. She bought winter clothes, they lost the trust of students' parents when Mr. Dabbas failed to provide the money or get visas in time. No one told GLOBE headquarters that no representatives from Jordan would attend—something FOES should have done.

As a result, teachers formed the GLOBE Jordan Society, which has been partially recognized as an NGO by the Government of Jordan. The Society began as a committee under the umbrella of FOES. This could have a very beneficial result on the sustainability of GLOBE by placing authority at the grassroots level, with the teachers themselves. Whether they have the power and authority to raise funds to guarantee GLOBE in Jordan is another issue. The society's leader is Maisa' Haddad, the GLOBE teacher at Salt Pioneer Center. She was elected by her colleagues in October 1998. Ms. Tubaishat is no longer officially involved in GLOBE.

Financial Management

Never over the life of the project did Ms. Tubaishat or Mr. Dabbas comprehend the financial management required of them. Twice in person and several times over the telephone, GreenCOM/Washington explained how to file fee payments and expense reports. Although these procedures are a bit cumbersome, most consultants master them after one try. For six months, GreenCOM did not receive a single request for fee payment from Ms. Tubaishat, and then they all came at once. GreenCOM saw only one expense report during the project. The car rental receipts were photocopied with only the dates altered in Arabic. Many of the other receipts were for refreshments that, based on workshop descriptions, seemed to have been donated. GreenCOM only received this report by temporarily withholding more GLOBE scientific equipment.

In the end, the scientific equipment was never purchased because of the high cost of packing and shipping hazmat materials. In November, Mr. Dabbas suggested that the Jordanian embassy in Washington cover shipping, that possibility never materialized. In Spring 1998, Ms. Tubaishat proposed that Royal Jordanian Airlines pay the shipping costs, that idea never advanced either. Trying to get a meaningful wish list from the field proved impossible even though the information was available on the World Wide Web.

Neither Mr. Dabbas nor Ms. Tubaishat filed expense reports for the Washington leg of their November 1997 trip, so they were never fully reimbursed. They received only an 80% advance as all other consultants do. GreenCOM covered their hotel, but one of them paid again! At the end of the project, Mr. Dabbas claimed that a FOES member had misplaced GreenCOM's second, final check for the second student-teacher workshop. AED's accounting department found that the check had been deposited long ago. Mr. Dabbas insisted and provided GreenCOM with a check number that was not an AED check number. Ms. Tubaishat commented often about his lack of financial management and misuse of funds. Teachers complained to GreenCOM on its final trip. They had difficulty getting reimbursed by FOES for telephone/Internet bills. In sum, financial management in Jordan was haphazard, fraught with errors, and ultimately suspect.

Computer and Scientific Equipment

Not only was the program cheated out of more kits, but it also lacked chemicals that could have been purchased easily in Jordan. The non-AED-provided computers, such as the one in Salt, were antiquated. GreenCOM did not hear of any efforts from FOES to help GLOBE schools upgrade or buy new hardware. Although the Internet infrastructure in Jordan was beyond project control and although not all schools could connect all the time, greater effort by FOES to bring the schools online would have been possible. Not all schools could connect all of the time. One of the most important aspects of GLOBE is student exposure to the Internet and communities of scientists and students worldwide. FOES has computers, but students cannot always travel to faraway Amman to enter data. Adult volunteers should not be the ones to enter students' measurements. Finally, GLOBE has not completed professional Arabic translations of the protocols. With such complicated concepts and procedures, this is a serious shortcoming. Not all of the GLOBE teachers in Jordan are as fluent in English as Maisa' Haddad, for instance. In other Arab countries, many fewer educators know English well.

Sustainability

Mr. Dabbas and Ms. Tubaishat were not used to raising or managing money outside of family circles. This should concern GLOBE and the Government of Jordan, if they wish to see the program continue. Fundraising now is very hit or miss, based on connections. Although Mr. Dabbas has assigned a chemical engineer to run FOES/GLOBE, he has not introduced him to the teachers, nor have they received him in their schools. This volunteer will supposedly accompany FOES' Peace Corps volunteer to the schools but no one knows this American's familiarity with GLOBE, and GreenCOM is concerned that this works against making GLOBE a Jordanian program. At FOES, GreenCOM concludes, there is no daily investment in GLOBE.

The teachers have formed the GLOBE Jordan Society. Although their legal status is in question, and their fundraising abilities are untried, their enthusiasm, dedication, and knowledge are present in spades. Apart from the students, they are the ultimate clients, the ones who should own the program.

RECOMMENDATIONS

GreenCOM would like to make the following recommendations:

- GLOBE should work more closely with GreenCOM (or other NGOs that implement GLOBE worldwide) on technical and administrative management. All project personnel in those organizations should have the opportunity to study GLOBE protocols.
- GLOBE should professionally translate its protocols into Modern Standard Arabic.

as soon as possible to help the program grow in Jordan and elsewhere in the Arabic-speaking world

- The Government of Jordan should appoint a new national coordinator and NGO They should seriously consider supporting the GLOBE Jordan Society, led by Maisa' Haddad The teachers know the program well
- Whomever the government appoints should be willing to work with the teachers on a daily basis and be very schooled in GLOBE, financial management and fundraising from the private sector in Jordan and other countries
- The appointee should pay immediate attention to upgrading computers and modems and purchasing more GLOBE kits and chemicals

E-MAIL ADDRESSES OF PROJECT CONTACTS

- Raouf Dabbas, national coordinator, GLOBE
[Friends_of_Environment@nets.com.jo]
- Khulood Tubaishat, GreenCOM GLOBE advisor
[khlodt@go.com.jo]
- Seta Tutundjian, delivery order COTR
[stutundjian@usaid.gov]
- George Sibley, head, Regional Environmental Hub, US Department of State
[gs-hub@usembassy-amman.org.jo]
- Lara Arjan, environmental specialist, Regional Environmental Hub
[la-hub@usembassy-amman.org.jo]
- Mary Sebold, program officer, GreenCOM/Washington
[msebold@aed.org]
- Michael Hales, program assistant, GLOBE/Washington
[mhales@aed.org]
- Kate Barba, USAID advisor to GreenCOM/Washington
[kbarba@usaid.gov]

FINANCIAL SUMMARY
(October 31, 1998)

		Budget	Vouchered 9/30/98	Estimated Accrued	Estimated To Date	Estimated Remaining
LOE	Days	228		24 5	42 50	185 50
Labor Days Ordered	Dollars	\$20,503	\$15,273	\$497	\$15,770	\$4,733
Other Direct Costs	Dollars	<u>\$29,474</u>	<u>\$20,156</u>	\$2,743	\$22,899	\$6,575
Total	Dollars	\$49,977	\$35,429	\$3,240	\$38,669	\$11,308

ATTACHMENTS

Delivery Order Scope of Work

Final Workplan

Transfer of Title of GLOBE Computer and Scientific Equipment

E-mail Testimonials

DELIVERY ORDER SCOPE OF WORK

(from original text of DO #21)

The Contractor will oversee the establishment of six schools as active participants in the GLOBE Program. Funds provided under this Delivery Order will support the procurement, installation and use of computer systems, basic training in program implementation for GLOBE teachers and the National Coordinator and on-site guidance in GLOBE schools. Each of the six participating GLOBE schools will be outfitted with computer hardware and software and basic measuring equipment (for students and teachers) necessary for participation in the program. An emphasis is placed on the development of public-private partnerships in the identification of resources to ensure ongoing support following the completion of this activity.

Needs Assessment

A GreenCOM Core staff member familiar with the GLOBE program will travel to Amman to

- Meet with the Jordan National Coordinator and USAID/Amman staff,
- assess computer needs, availability, capacity, costs and shipping constraints,
- identify sources for procurement of computers, measuring equipment needed for the program,
- develop/confirm school site selection criteria and, if possible, visit selected schools,
- identify/recruit ½ time Jordanian Advisor,
- develop workplan that includes preliminary plans for a teacher-training workshop and
- identify possible collaborators/additional resources,
- debrief and leave draft workplan with USAID/Amman

The Contractor will identify a Jordanian GLOBE Advisor to serve as GreenCOM liaison, the individual who will have overall responsibility for implementation of the activity. The GLOBE Advisor will work on a half-time basis and will work closely with the National Coordinator and GreenCOM/Washington staff in the development and implementation of the program. His/her responsibilities will include school site selection, oversight of computer procurement and installation, the coordination of a GLOBE Teacher Training Workshop, assistance in establishing public-private partnerships and provide general support on an ongoing basis for selected schools. A minimum of six schools will be selected to participate in the program, each to receive computer hardware and software necessary to participate in the program, as well as basic measuring equipment to collect data according to the program protocols. Additional schools may participate based on interest and availability of resources.

Funding is provided in this Delivery Order for the GLOBE Advisor for up to 60 days of local transportation costs to visit schools. The Contractor will organize a GLOBE Teacher Training Workshop for a minimum of 15 participants. GLOBE staff in Washington will collaborate with technical assistance in the implementation of this teacher training workshop.

The Contractor will identify a vendor for computer procurement based locally in Amman to

provide ongoing technical hardware/software assistance on site over the life of this Delivery Order. The Vendor will install equipment on site and be available for periodic consultation at schools. The Contractor will make every effort to ensure the development of partnerships to sustain program costs following completion of this activity.

A GreenCOM Contractor Core staff member will travel (salary costs are covered under the core contract) a second time for a period of two weeks once the schools are actively participating in the program for management oversight, review and to provide support for the activity. Travel and per diem for this trip is provided for in this Delivery Order.

FINAL WORKPLAN

(Revised and submitted after approved modification to USAID/Amman on April 15, 1998)

1 Introduction

A The GLOBE Program

The GLOBE Program (Global Learning and Observations to Benefit the Environment) was initiated by US Vice President Albert Gore in 1994. The program was officially launched on the 25th Earth Day on April 22, 1995. Currently, over 4000 schools are involved worldwide in over 47 countries. In total, 119 countries have expressed their interest in the program.

The GLOBE program is a hands-on environmental science education program that joins students, teachers, and scientists from around the world in measuring their local environment and studying global environmental systems. The objectives of the GLOBE program are:

- to enhance the environmental awareness of individuals worldwide,
- to increase scientific understanding of the Earth, and
- to help all students reach higher standards in science and mathematics.

GLOBE is creating a worldwide network of primary and secondary students working under the guidance of trained teachers to conduct the GLOBE program in their schools. Doing so means they will:

- make GLOBE environmental measurements according to specific protocols at or near their schools,
- report their data to a GLOBE data processing facility,
- receive and use global images created from worldwide GLOBE school data, and
- study environmental topics in their classrooms.

The environmental science community is involved in the design and implementation of the GLOBE program to ensure that GLOBE environmental measurements will make a

significant contribution to the global environmental database. Over 100 scientists have participated in the selection of GLOBE scientific measurements and measurement procedures, including overall quality control of data. Students make measurements in the areas of atmosphere, climate, hydrology, biology, and soil science. The data acquired from these measurements support environmental research.

Grade-appropriate GLOBE education materials have also been developed for use in GLOBE schools. These learning activities help teachers explain the concepts behind the measuring procedures and what the data mean.

B GLOBE in Jordan

The GLOBE/Jordan agreement was signed October 31, 1996 between the Ministry of Municipal and Rural Affairs, the Ministry of the Environment, and the American Ambassador to Jordan. The NGO, Friends of Environment Society (FOES), is a volunteer organization led by Raouf Dabbas and was designated to coordinate and implement activities of the GLOBE program.

FOES is an independent, non-profit non-governmental organization formed in 1994. It is dedicated to enhancing community development and encouraging youth to take an active part in conserving and improving their natural environment. FOES is funded by donations from the business community, individuals, and organizations as well as by membership fees. FOES sponsors several types of environmental education activities with schools, such as the Annual Environmental Competition for secondary students on environmental problem solving and the children's environmental calendar.

Environmental education is a growing component of school and extracurricular activities in Jordan. Several organizations are developing curriculum supplements, youth programs, and teacher training opportunities. As the public becomes more aware of environmental issues, and as teachers become more interested in interactive, engaging student activities, programs like GLOBE become well-suited for schools in Jordan.

GLOBE is ideally suited for use in Jordanian schools because it combines international expertise and tested experience with the ability to localize information, making GLOBE lessons relevant to the students. Several aspects of GLOBE are readily accepted by Jordanian educators:

- lessons and materials are structured in a hands-on, investigatory approach to science education, creating a student-centered learning environment,
- the use of scientific equipment generates interest and excites students about data collection and careers in environmental science,
- the traditional separation between the scientific community and the public will be decreased as students take measurements and contribute good quality data,
- computers are used to send data to the GLOBE server and receive graphic images,

- helping students understand this use for computers and technology, the measurements, concepts, and research revolve around real issues and current questions about our planet, involving students in a meaningful and relevant program, and
- students are cooperating in an international program with the possibility of generating and extending their network of colleagues and friends

C The Role of GreenCOM in Jordan

GreenCOM in General

The Environmental Education and Communication Project (GreenCOM) is a United States Agency for International Development (USAID) Project. GreenCOM uses environmental education and communication strategies to help people change behaviors in the short-term, while giving them the knowledge and skills to tackle long-term environmental concerns. GreenCOM combines social marketing, development communication, education, participatory methods, gender analysis, capacity building, and applied research to develop site-specific solutions around the world.

GreenCOM is jointly funded by G/ENV and G/HCD of the Bureau for Global Programs, Field Support and Research (Contracts PCE-5839-C-00 and 5839-Q-00-3069-00) and by USAID missions at collaborating sites. The project is designed to operate for a seven-year period from September 29, 1993 to September 28, 2000. USAID contracted with the Academy for Educational Development (AED) for the management of the project. AED subcontractors include Chemonics International, Global Vision, and the North American Association for Environmental Education (NAAEE).

GreenCOM's expertise and technical assistance include four components:

- Applied research including target audience characteristics, pretesting, monitoring, comparison studies, program impact assessment, evaluation, and behavior and gender studies,
- Information exchange including research reports, periodic bulletins, and publications and a Resource Center based in Washington DC,
- Operations support in formal and non-formal environmental education and environmental communications, and
- Synthesis and dissemination through a methods handbook, instructional video, training programs, and published papers

In June, 1997, USAID/Washington signed a delivery order agreement (# PCE-Q-00-93-00069-00, Delivery Order #21) with GreenCOM to provide technical assistance to the GLOBE Program. The delivery order will be completed within 15 months (June 23, 1997 to September 19, 1998) and includes funds for equipment and technical assistance in Amman, Jordan. This workplan describes the objectives, outputs, activities, deliverables,

and timeline of this delivery order

GreenCOM Objectives in Jordan

The overall objective of the GreenCOM in Jordan is to assist in the development and sustainability of a GLOBE program. This seed funding will help develop demonstration GLOBE schools to implement the program and help leverage private sector support and partnerships. The specific objectives include:

- a. Provide technical assistance to the coordinating NGO for GLOBE in Jordan
- b. Coordinate a GLOBE workshop for educators, emphasizing the proper collection and reporting of environmental data
- c. Establish six GLOBE study sites at secondary schools and provide each a computer and scientific instruments for data collection
- d. Provide Internet accounts to all of the six schools that can be connected as well as additional scientific equipment if funds allow
- e. Provide on-going support to teachers at these sites through visits, periodic communication, and workshops

D USAID's Program Strategies

USAID/Jordan has emphasized the water sector in its strategic objectives. GLOBE, and, in this case, GreenCOM/GLOBE/Jordan falls under Strategic Objective #2 Improved Water Resources Management, Intermediate Result 2.1 Stronger Water Sector Institutions, and Indicator 2.1.2 Number of People with Awareness of Conservation and Scarcity Issues.

As an environmental education project, GLOBE fosters environmental awareness. A large part of the environmental awareness in the Middle East, generally, and in Jordan, particularly, is awareness of water---its quantity and quality, as well its importance to life be it human, animal, or plant. GLOBE educates future generations to sustain awareness of conservation and scarcity issues. GreenCOM's strength, in turn, is environmental education and communication.

2 Outputs and Activities

OUTPUT #1 Provide Technical Assistance to FOES

General Description

The GLOBE Program is a blend of science and technology in education Leadership for GLOBE in any country should involve a team of people with expertise in all areas FOES coordinates a volunteer force of computer experts, scientists, and educators Because the successful implementation of GLOBE in schools often results from careful adaptations of both the curriculum and the protocols (so that students understand what is being measured while completing their scholastic requirements), on-going assistance to teachers should include both the scientific and the curricular aspects of the program

In Jordan, GreenCOM will hire a part-time environmental educator to act as the liaison between GreenCOM and FOES and to work closely with the GLOBE country coordinator to assist FOES in implementing GLOBE in Jordan A good working relationship in this rather technical and specialized task will require a great deal of honest communication, respect, responsibility, and trust among all parties In this case, because FOES is designated by the Ministry of the Environment as the implementing agency for GLOBE, and GreenCOM has chosen a non-FOES member to be its liaison or GLOBE advisor, our staff person will provide technical assistance (facilitate training, coordinate workshops, suggest teachers, lead supplemental training, visit schools, etc) in consultation with FOES volunteers FOES volunteers will accompany the GLOBE advisor on site visits, assist with training programs, and help provide support to teachers In this way, our technical assistance will build the capacity of FOES to sustain GLOBE in Jordan

The GLOBE advisor will also assist FOES in the development of a fund-raising strategy to attract resources and in-kind support for GLOBE

Activities

The GLOBE advisor will establish a good working relationship with FOES and other businesses, agencies, and organizations that support environmental education She will identify the first set of schools and teachers to participate in GLOBE training She will coordinate all training activities and support teachers in their efforts to implement GLOBE in their schools (see Output #4)

She will assist FOES volunteers in their ability to lead training workshops for teachers and provide on-going site support She will help FOES in establishing Internet at the schools, which may necessitate a GLOBE server at the FOES office

The GLOBE advisor, with support from GreenCOM, will support development of a fund-raising strategy to enable FOES to establish a broader base of support for GLOBE

Deliverables

- a Hire a GLOBE advisor
- b Identify six schools and teachers for GLOBE training
- c Prepare a workplan for GLOBE/Jordan
- d Debrief the US Embassy/Jordan

e Train GLOBE personnel in fund-raising through a study tour in Washington, DC from November 24-26, 1997

OUTPUT #2 Train Educators and Leaders in GLOBE Program

General Description

The GLOBE Program requires that teachers perform a specific set of measurements with their students and report them according to a certain procedure so the data are useful to scientists. GreenCOM will enable at least 15 teachers from Jordan and several FOES volunteers to be trained in these GLOBE protocols. Although GreenCOM expected the GLOBE office in Washington, DC to conduct an international training workshop in Jordan during the initial stage of this activity, this training was politically infeasible. Therefore, an introductory three-day GLOBE training activity was led by a GreenCOM staff/GLOBE trainer instead. The workshop enabled teachers and FOES to launch GLOBE activities with the new school year. It was not a complete orientation to the GLOBE program because time did not allow coverage of the soil protocols.

The GreenCOM advisor will work with FOES to arrange and conduct the teacher training workshops in Jordan. The workshop will include basic information about how GLOBE functions, what students contribute, what scientists glean, and how the Internet can facilitate international communication of data and ideas.

Participants will learn how to conduct measurements according to GLOBE protocols for atmosphere, biometry, water quality, land cover, and GPS. Participants will become familiar with the equipment and its calibration (GPS receiver, max/min thermometer, densimeter, hydrometer, rain gauge, water testing kits, Secchi disk, etc.). They will also explore several teaching activities suggested in the *Teachers Guide*. A field trip to create a land cover plot and collect water samples will be part of the workshop. At the conclusion of the workshop, FOES and the GLOBE advisor will work with each teacher to ascertain equipment and computer needs and develop a work plan for their school.

Because this introductory workshop was not complete, this project will send two key trainers (one from FOES and the GLOBE advisor) to the International GLOBE Conference in Miami in November 1997. During this conference, they will learn the remaining soil protocols and gain an appreciation of the GLOBE program around the world.

These key trainers will return to Jordan to facilitate a second teacher training workshop in or after December 1997 about the soil protocols and to encourage teachers to share their successes and concerns about GLOBE with each other. Again, FOES will coordinate the second workshop with assistance from GreenCOM.

Activities

GreenCOM will subcontract the organization of both teacher workshops to FOES, who will arrange for teacher accommodations, food, equipment, field trip site, and closing ceremony. A GreenCOM staff member who is also a GLOBE trainer will conduct the first workshop. GLOBE staff will lead the Miami conference, and Jordanian participants will conduct the second teacher workshop. GLOBE instructional materials will be provided to all participants. Equal representation of male and female teachers will be encouraged. The workshops will introduce all scientific protocols and computer aspects of GLOBE, as well as give teachers time to practice collecting data and use the computer to send and receive data.

Deliverables

- a Introduce educators in Amman to the GLOBE program with a three-day workshop
- b Train key educators from Jordan at the International GLOBE Conference in Miami
- c Continue to train educators in Jordan with a second teacher workshop

OUTPUT #3 Establish GLOBE Program in targeted schools

General Description

To create functioning GLOBE schools, a variety of tasks must be accomplished, depending upon the implementation plan at each school. A needs assessment must be conducted to determine if existing equipment will suffice for GLOBE measurements. Additional teachers may need to be trained to assist in data collection. A few students may be selected to conduct measurements, or units may be prepared to teach all students about the GLOBE protocols. Computers must be set up. Internet access accounts must be purchased. Teachers and students must become familiar with accessing the GLOBE web pages, data entry forms, and graphic reports. If several schools can share equipment or a computer, arrangements for doing so must be negotiated.

Activities

- 1 Teachers will survey their equipment, select study sites, take a GPS reading, and complete a GLOBE school profile. The GLOBE Country Coordinator will submit these profiles and receive school codes.
- 2 The GLOBE advisor will work with FOES and GreenCOM to research equipment, phone, and Internet account costs, and order the required equipment and accounts from the most reasonable supplier, in accordance with USAID regulations. Equipment and computers will be distributed to schools.
- 3 On receipt of the school codes, teachers will begin to measure certain types of environmental data and report the results. Upon receipt of new equipment, additional environmental data will be collected.

Deliverables

- a Six school profiles submitted to GLOBE/Washington

- b Delivery of six computers and six sets of scientific equipment to six schools in Jordan
- c Additional equipment delivered to additional schools if money is available

OUTPUT #4 Provide support for GLOBE teachers

General Description

Becoming a GLOBE school requires a significant amount of work. As in the establishment of any innovation, some people will succeed easily while others will be stymied by obstacles. Past history with GLOBE indicates that there are significant barriers to GLOBE implementation. Teachers may need computer support, scientific assistance, ideas from the scientific community about ways to teach GLOBE concepts, meetings with colleagues who are solving similar problems, and opportunities to exchange ideas with other teachers. As the GLOBE program gets started, these initial teachers will become more proficient and more committed GLOBE teachers if they are encouraged to train other teachers in the GLOBE protocols.

Activities

1 The GLOBE advisor will travel to GLOBE schools with FOES volunteers to inspect the study sites and data collection areas and to answer questions as the teachers begin to collect data. As needed, computer support personnel or other specialists may be sent to assist the teachers.

2 If additional resources are available from other sources, additional teacher training workshops may be conducted to share information, communicate experiences with other teachers and introduce GLOBE to new educators.

Deliverables

- a Bimonthly reports on teacher activities
- b Final report on activities of GLOBE schools in Jordan

3 Timeline

OUTPUT #1 Provide Technical Assistance to FOES

Activity	1st	2nd	3rd	4th	5th	Qs
1 Identify potential GLOBE schools and teachers	x					
2 Assist FOES	x	>	>	>	>	
3 Gain fund-raising strategy skills		x				

Deliverables

- 1 Hire GLOBE advisor x
- 2 Identify schools and teachers x

3 Prepare and deliver work plan	x					
4 Debrief US Embassy/Jordan	x					
5 Train GLOBE personnel in fundraising			x			

OUTPUT #2 Train teachers and leaders in GLOBE Program

Activity/Deliverables	1st	2nd	3rd	4th	5th	Qs
1 Coordinate 1st workshop		x				
2 Attend Int'l conference			x			
3 Lead 2nd workshop				x		

OUTPUT #3 Establish GLOBE Programs in Targeted Schools

Activity	1st	2nd	3rd	4th	5th	Qs
1 Survey equipment, select sites		x				
2 Research costs, purchase equipment	x	x	x			
3 Set up computers, Internet access		x				
4 Measure/report GLOBE data		>	>	>	>	

Deliverables

1 6 School Profiles		x				
2 Confirmation of computer installation		x				

OUTPUT #4 Provide support for GLOBE teachers

Activity	1st	2nd	3rd	4th	5th	Qs
1 Travel to sites, provide support		>	>	>	>	
2 Host workshops as funds allow		x	x	x	x	

Deliverables

1 Periodic report(s)		x	x	x	x	
2 Final report				x		

**TRANSFER OF TITLE OF GLOBE COMPUTER AND SCIENTIFIC
EQUIPMENT**

E-MAIL TESTIMONIALS

(On following pages)



Academy for Educational Development

Memorandum

October 8 1998

To Mr Raouf Dabbas, President, FOES
From Mary N Sebold, Program Officer, AED/GreenCOM
Subject Transfer of Title of GLOBE Computer and Scientific Equipment

The equipment listed below was purchased for the GreenCOM Project as authorized under USAID contract no PCE-Q-00-93-00069-00 with the Academy for Educational Development (AED) In accordance with H 4 (H)(2)(E) of that contract, the below-named items are hereby presented to the Friends of the Environment Society (FOES), the NGO designated by the Government of Jordan to coordinate GLOBE activities

COMPUTER EQUIPMENT

<u>Description of Item</u>	<u>Serial #</u>	<u>Total Price/Value</u>
1) Computer Desktop, WIN 486DX2 50SG/8/210	9408020008	\$375
2) Computer Desktop, WIN 486DX2 50SG/8/210	9408020010	\$375
3) Computer Desktop WIN 486DX2 50SG/8/210	9408020018	\$375
4) Computer Desktop WIN 486DX2 50SG/8/210	9408020019	\$375
5) Computer Desktop, WIN 486DX2 50SG/8/210	9408020020	\$375
6) Computer Desktop WIN 486DX2 50SG/8/210	9408020028	\$375

SCIENTIFIC EQUIPMENT

Purchased 7/15/97

Scientific Technology, Inc , 205 Perry Parkway, Suite 14, Gaithersburg, MD 20877

Telephone (301) 948-4674

Total Price \$3,857.64

Quantity

Description of Item

1)	6	Min/Max thermometer
2)	6	Calibration Thermometer
3)	6	Instrument Shelter
4)	6	Rain Gauge
5)	6	Organic Thermometer
6)	6	pH Meter
7)	6	Buffers (4/7/10 pH)
8)	6	Dissolved Oxygen Kit
9)	6	Water Alkalinity Kit
10)	6	Safety Equipment
11)	6	Conductivity Tester
12)	6	Calibration Solution
13)	6	Tape Measure - 50 m
14)	6	Soil Sample Cans (12 ea)
15)	6	Auger
16)	6	Color Chart
17)	6	Graduated Cylinders w/ stoppers
18)	6	Dispersing Solution

The items above comprise six GLOBE 97 Advanced Kits. They have been well used in schools throughout the academic year and are considered expendable equipment.

Signed on this Oct 7 day of October 1998

Presented by Mary N. Sebold
Mary N. Sebold

Received by Raouf Dabbas
Raouf Dabbas

From "Khulood A Tubaishat" <khulodt@go.com.jo>
To "Mary Sebold" <msebold@smtp.aed.org>
Date Wed, Jul 1, 1998 10:49 AM
Subject Fw: Your Wonderful Schools!

> From: Sherril J Wormstead <sherrw@unh.edu>
 > To: FOES@nets.com.jo, khulodt@go.com.jo
 > Subject: Your Wonderful Schools!
 > Date: 23/07/1998 02:40 a.m.
 >
 >
 > Dear Mr Raouf Dabbas & Khulood
 >
 > Four of your schools deserve a great congratulations they are
 > reported Qualitative and/or Quantitative Land Cover Sample Sites. We are
 > very excited that they have been working on their GLOBE Land Cover
 > Investigation and look forward to working with them in the future. The
 > schools are
 >
 > Karak Pioneer Centre, Karak
 > Mua'addi Secondary School for Boys, Deir Allah
 > Salt Pioneer Centre, Salt
 > Irbid Pioneer Centre, Irbid
 >
 > We have already communicated with and congratulated the first three
 > schools. However, there is no email address listed for Irbid Pioneer
 > Centre, Irbid. We would like to thank them for their great work and
 > communicate with them via email.
 >
 > We understand that perhaps not all schools have access to the
 > internet. Can you please see if you can find an email address for Irbid
 > Pioneer Centre, Irbid?
 >
 > Thank you in advance & thanks for all of your great work for The GLOBE
 > Program in Jordan.
 >
 > Sincerely,
 >
 > Sherril Wormstead

 > Sherril J. Wormstead
 > GLOBE Land Cover/Biology Investigation Team
 > University of New Hampshire
 >
 > 215 James Hall (603)862-4178
 > Durham NH 03824 sherrw@hopper.unh.edu
 >

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From "Kate Barba" <kbarba@usaid.gov>
To 1875 GWIA("pspain@aed.org","msebold@aed.org","mona
Date Mon, Aug 31, 1998 11 01 AM
Subject fwd Re gratitude

nice letter, below, from a GLOBE teacher in Jordan
Many thanks, Khulood, for making it happen!
Kate

Original Text

From "Michael Hales" <mhales@globe.gov>, on 8/31/98 10 48 AM
To <kbarba@usaid.gov>

>Dear Maisa'

>

>On behalf of everyone at the GLOBE office in Washington D C and others who
make up the GLOBE Team outside of these walls, we would like to express our
deepest appreciation for your wonderful message We are delighted to hear
about how excited your stu
dents are to participate in GLOBE, and how they are not only learning a lot
about science and the environment but are even learning about themselves
You've reminded us all how important and meaningful our work is for
students around the world Thank
you so much for taking the time to share your thoughts with us We will
always remember them

>

>Best regards,

>

>Michael Hales

>(on behalf of the GLOBE Program)

>

>

>

>>On Mon, 17 Aug 1998, Salt Pioneer Centre wrote

>>

>>> Dear Sir / Madam

>>> Could you please deliver this message as I don't seem to have the
>>> addresses?!

>>>

>>> To GLOBE leadership council GLOBE staff GLOBE scientists, and
everyone in

>>> the GLOBE Programme

>>>

>>> This is just to express my deep thanks and gratitude for all of you for
>>> giving us the opportunity to work with the programme and be part of it
It

>>> is true I have never liked a programme as I did like this one This is
the

>>> first time I do really feel a sense of purpose I mean, Oh God, finally
I'm

>>> doing something real It is embarrassing but nice to say I feel just
like a

>>> young child who is very excited I can't help showing my extreme
excitement

