

Country Report

Argentina

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Given the tradition that has PROGRAM GLOBE in Argentina and its continuity in the time, I have thought every year to dedicate a preferential space to him to each region of Argentina. For this reason I accompany this year a detailed report for schools of our Patagonia, that send information and that uninterruptedly year after year they generate new interests of investigation.

Provincial Integration

The Dr. Edgar CRINO of the National University of San Luis that attended the workshop of November of 2000, Crino organises with the auspice of its University and the Ministry of Education of San Luis's Province during the year 2001 workshop to teach to the Scholastic Coordinators. In order to be able to make these Factories I facilitated the material to him that had the American Latin Factory that we had done in 2000.

Presentation of PROGRAM GLOBE in International Congresses

Cuarta Reunión Anual del SETAC Latinoamericana 22 al 25 de octubre 2001. Avenues Toward Environmental Protection in Latin America

Joint activities with the Scientific Agregaduría of the Embassy of the United States

The Embassy of the United States this year has organized jointly with the NASA, the CONAE and schools located in different provinces and with the school from Base Hope that is in the Antártida a TELECONFERENCING, really very interesting. It was a succesful.

New Consultative Advice

Have designated new members of the Consultative Council.

- Dr. Machado Marcos of the CONAE.
 - Dra. Inge Thiel. Doctor in Chemistry of the UBA.
 - Engineer Horacio Galloni - Physical.
 - Engineer Carlos Merenson. Specialist in Forest Areas.
 - Architect Leonardo Simone. Environmental Urban developing specialist
- All these specialists evolve in honorary form within the área of their specialty.

HP gives computers to schools:

1. Colegio de Nueva Galia (San Luis 's Province).
2. Colegio de Buena Esperanza (San Luis 's Province).
3. Colegio de Santa Rosa (San Luis 's Province).
4. IPEM 204 "Ing. Alberto E. Lucchini" (Cordoba 's Province).
5. Brigada Ecológica Sancarlina.
6. Unidad Educacional Instituto Sarmiento.
7. Escuela de Enseñanza Media 7 "Nicolás Copernico".
8. Instituto "Luis A. Huergo".
9. Escuela N° 440 "Simon de Iriondo" (Santa Fe 's Province).
10. Colegio La Salle (Santa Fe 's Province).
11. Escuela Normal Superior "General José de San Martín".
12. Escuela de Comercio N° 30 "Dr. Esteban Agustín Gascón".
13. Instituto La Salle San Martín.

Participation of the Centro de Educacion Integral "San Ignacio" Fundacion Cruzada Patagonica in the GLOBE Program

Investigation in Hydrology

Report 2001-2002

Authors:

2nd and 3rd Year Students of the High School

Centro de Educación Integral (CEI) "San Ignacio"

Responsible teachers:

Prof. Ana B. Prieto

Prof. María Eugenia Bertossi

Junín de los Andes – Pcia. de Neuquen - Argentina

History of the GLOBE Program in Argentina

The GLOBE initiative was introduced on the Earth Day, April 22, 1994. The operations began on the Earth Day 1995. At the moment there are more than 10.000 schools inscribed in the entire world in the Program. More than 6.000 schools of them are in the USA, in Argentina 46 schools participate in the program and our school is in Patagonia (CEI "San Ignacio in Neuquen province), another school in Rio Negro province and one in Antarctica. At present more than 90 countries hare joined the program.

In December 1994, a resolution of United Nations was approved favoring the GLOBE Program and urging all countries to participate; it also requests agencies of the UN to support the implementation of the Program in different countries.

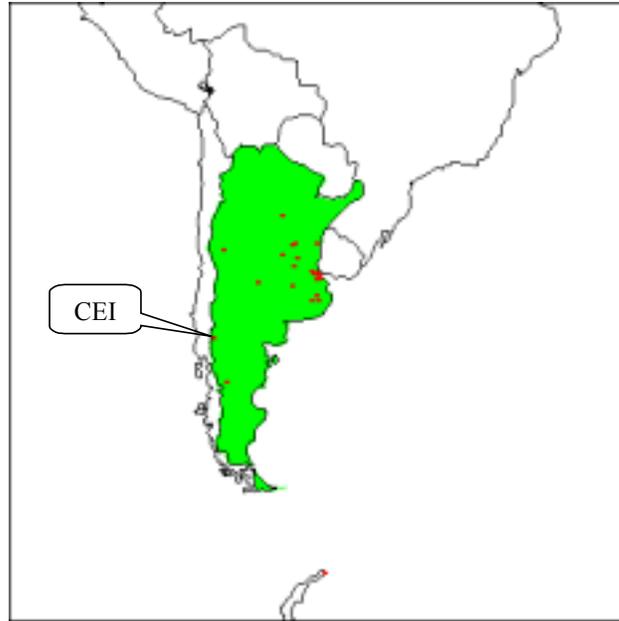


Fig. 1 . The red dots indicate the locations of the schools that participate in the GLOBE Program in Argentina.

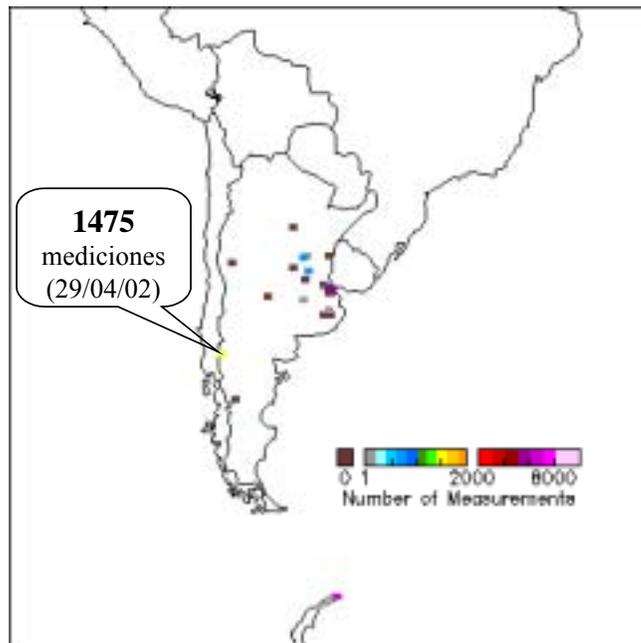


Fig. 2. The colors of the dots indicate the number of measures carried out (from the beginning) for the schools that participate in the GLOBE Program in Argentina.

Localization of the school (CEI “San Ignacio”) with GPS

In the CEI "San Ignacio" the GPS was used for: 1) to locate the exact point of the entrance of the school, 2) to locate the exact points of sampling.

The localization data obtained with the GPS are loaded in the web site of the GLOBE Program. The program uses a Geographical Information System (GIS) that allows locating accurately in a world map the exact point of the door of entrance of the school (CEI “San Ignacio”) and the sampling points.

The Geographical Information System is used for the positioning and management of information. It has enough precision because it uses:

- GPS
- Satellites Images
- Field Information (physical-chemical determinations sent by the participant schools)
- Construction of maps

Later on, all the data is shared with the entire world by means of Internet with the schools and participating institutions.

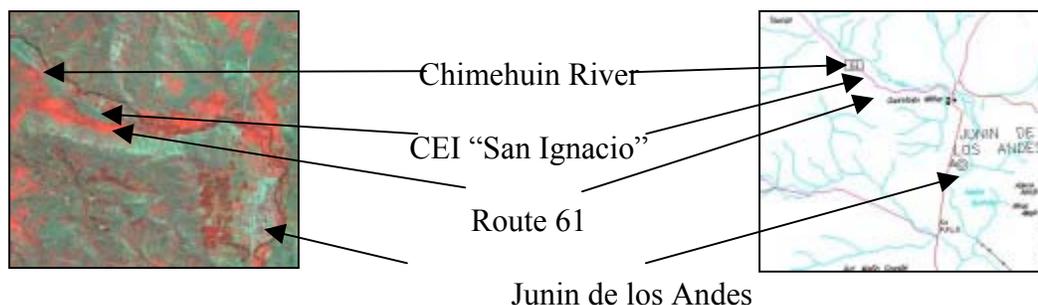


Fig. 3. Elaboration of a map from a satellite image.

Investigation in Hydrology

We consider to begin with the investigation in hydrology the Chimehuin River is very near the school (CEI “San Ignacio”). This river is important to investigate because the water is used for human consumption at the school and it also for watering the vegetable gardens of the school.

The measured parameters were the following ones:

1. Depth of the Secchi Disk.
2. Temperature of the water.
3. pH.
4. Oxygen dissolved in water.
5. Conductivity of the water.
6. Alkalinity of the water.
7. Nitrates dissolved in water.

The hydrological measurements have a weekly frequency carried out in points 1 and 2, every Wednesday 15:30, responsibility of 3rd Year Student of High School and for points 3 and 4 every at Tuesday at 15:30, responsibility of 2nd Year students of High School)

Methodology and results

1. Depth of the Secchi Disk

Sample points: Point 1 Chimehuin River, only because the other points correspond to not very deep channels and a long spool.

Method: The students submerge (black and white) a bicolor disk until the moment he loses sight of it and then measures the depth.



Objective: To detect the turbidity of the water qualitatively.

Importance of the measurement: It perturbs the life of aquatic insects; crustaceans and small fish can cause the so many deaths of eggs like adults when impeding their respiration. In the algae it impedes the respiration and the photosynthesis. It causes sedimentation in the river and in the channels ending up covering them. It can stop up pipes. It contributes nutrients due to the gliding of the terrestrial surface.

Results: The Secchi Disk was always visible and got to the bottom. This indicates an excellent transparency of the water.

2. Temperature

Sample points: All the points.

Method: It is used a thermometer of alcohol or the temperature sensor of the equipment JENCO Mod. 6350.

Objective: To know the temperature of the water and to study its variation through the year. To know its interaction with other chemical compounds.

Importance of the measurement: The temperature of the water influences in the quantity and diversity of the aquatic life. The temperature of the bodies of water can vary thoroughly, due to the latitude, the altitude, the hour of the day, the station, the depth of the water and great variety of factors. The excessive increase of the temperature can be fatal for some sensitive species that require cold and rich conditions of water in oxygen like the salmonids and some aquatic insects. It also generates proliferation of undesirable bacteria for the agriculture, stagnation and floods, micro-habitat in arable places in pipes, filters and reservoirs. The water is darkened by bacterial proliferation. The temperature has an important function in the physical, chemical and biological processes that are developed in the bodies of water. The temperature of the water determines that plant and aquatic animals can be present because all the species have their natural limit of tolerance to high or low temperatures. The temperature of the water is determined by the quantity of solar energy that it absorbs. The discharge of liquid waste coming from factories and of urban areas increases the temperature. The evaporation process diminishes the temperature, but only in the superficial layer of the bodies of water.



Results:

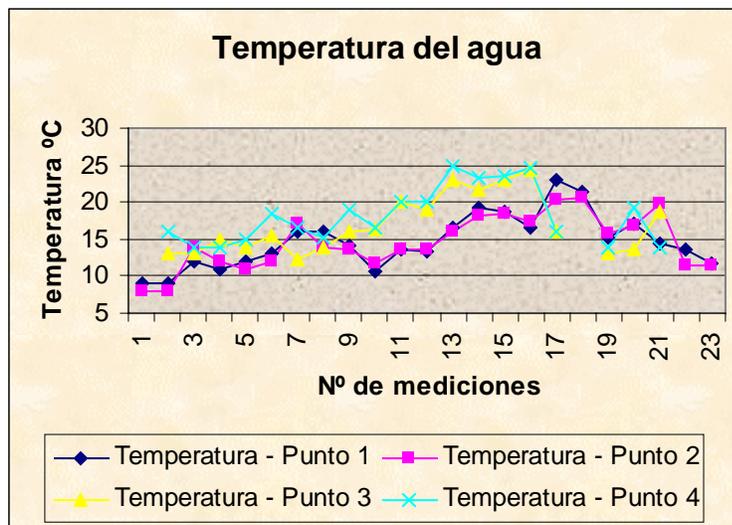


Fig. 7. Variation of the temperature though the year in each one of the Sample points.

The temperatures of the points 1 and 2 are very similar because they correspond to the Chimehuin River and a near long spool; on the other hand the points 3 and 4 correspond to channels to open sky where the daily thermal fluctuation of the air impacts notably.

In the channels the temperature was it is generally higher than the temperature of the Chimehuin River and long spool. This can be due to be hour of measuring 16:30 that because receives the effect of the highest solar radiation.

3. pH

Sample points: All the points.

Method: The pH sensor of the equipment JENCO Mod. 6350 is used.

Objective: To know the pH of the water and to study its variation though the year. To know their interaction with other measured parameters. To determine sources of indirect contamination.

Importance of the measurement: The pH is a measure of the acid or alkaline contents of the water that influences great part of the chemical processes. The pH of the water has a strong influence on the life that can exist in it. The range for most of the organisms is of 6,5 - 8,2. The pH of the watering water influences on the pH of the floor and the growth of the plants. Many vegetables fields (horticultural, aromatic, bushes, arboreal, ornamental, fruit-bearing and forages) they are sensitive to the pH changes. The pH changes cause changes in the vegetation of the pastures and in the processes of fermentation, producing the growth of algae, mosses and gramineous. They also cause a succession of rhizomes and they cause a cooling of the floor and maintenance of humidity for longer period. This problem causes "lacks of floor" to come in to cut or for the shepherding. The horticultural species require a slightly acid pH. Other species diminish their quality or don't grow in floors watered with water of variable pH. The very high pH in the watering water disperses the particles that obstruct the pores of the floor generating infiltration problems and of change of cultivations.

Results:

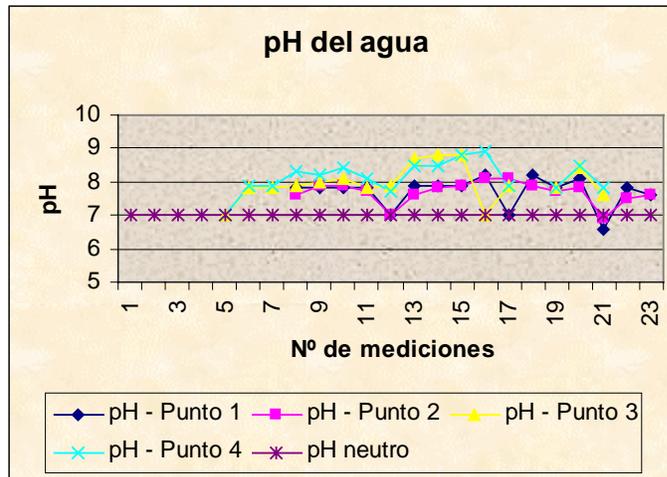


Fig. 8. Variation of the pH of the water though the year in each one of the sample points. The line in pH 7 indicates the neuter value as reference.

The pH value is slightly alkaline, although in the channels by human action of the surroundings, and the little flow this alkalinity increased to 9 some days.

4. Dissolved oxygen

Sample points: All the points.

Method: A kit HANNA Mod HI 3810 is used.

Objective: To know the dissolved oxygen of the water and to study its variation through the year. To know their interaction with other measured parameters. To determine sources of indirect contamination.

Importance of the measurement: The oxygen is dissolved in the water together with the other gases that integrate the air. That oxygen is taken advantage of by the organisms to respire. In the water the oxygen is limited and frequently they determine the quantity and diversity of organisms that can live in a place. Most of the organisms require at least 6 mg/l to survive.

The levels of smaller dissolved oxygen to 3 mg/l have a strong pressure on most of the organisms. The excess of organic matter in the water coming from dead animals and plants that reach the coastal ecosystems or of cultivations can reduce the quantity of oxygen in the water.

The quantity of oxygen in the water is affected by several factors, such as the temperature, the height of the sea level, the dissolved solids, the respiration and the photosynthesis. The oxygen variation causes processes of ecological succession in the river and channels with changes in the coastal flora that can cause floods, overflow and pH changes.



Results:

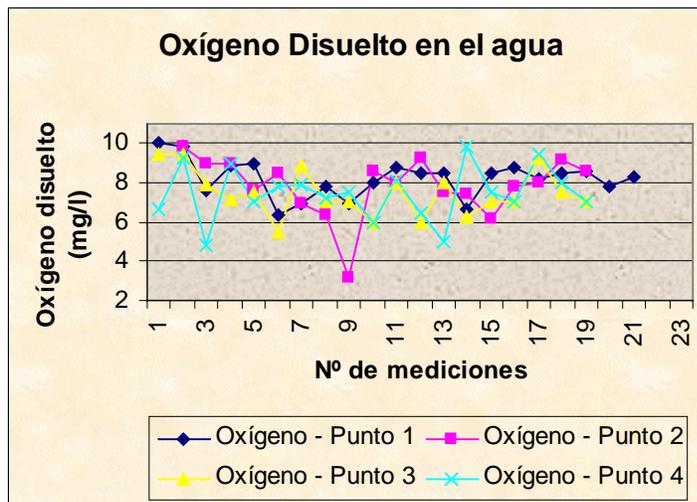


Fig. 9. Variation of the oxygen dissolved in water through the year in each one of the sample points.

The quantity of dissolved oxygen diminishes a little in spring and summer coinciding with the higher temperatures. To increased temperature the water has less capacity to retain oxygen.

The descent of the oxygen values it is very marked in the channels compared to the values of the Chimehuin River. This can be due to the human action of the surroundings and the scarce flow of

the channels. In point 2 (Canilla huerta chica) that correspond to the spool important decreases of the quantity of dissolved oxygen. This can be related to the water in the pipes. It is important to highlight that in very few occasions of smaller dissolved oxygen registered to 6 mg/l whit belongs the limit of survival most of the living beings. Only the Chimehuin River on some occasions the value coincides for with rainy days when the haulage of solid particles takes place and of organic matter, which has possibly been the cause of its descent.

5. Conductivity

Sample points: All the points.

Method: The conductivity sensor is used with compensation of temperature of the equipment JENCO Mod. 6350.

Objective: To know the conductivity of the water and to study its variation though the year. To know their interaction with other measured parameters. To determine sources of indirect contamination.

Importance of the measurement: The pure water is a poor driver of electricity. The impurities of the water (dissolved salts) are that allows that conductivity. Each one of the salts could be analyzed dissolved water, but has been an indicator of the level of impurity in the fresh water measuring the effectiveness with which the water transmits electricity. The temperature affects the conductivity of water. In most of the agricultural and municipal uses it is that the water has required a total content of dissolved solids under the 1000 or 1200 ppm, or an electric conductivity under 1500-1800 microSiemens/cm.

For domestic uses, the water should contain less than 750 microSiemens/cm.

The factories and, mainly the electronics, require waters free of impurity.

The snow of remote areas has a conductivity of 50 microSiemens/cm.

Results:

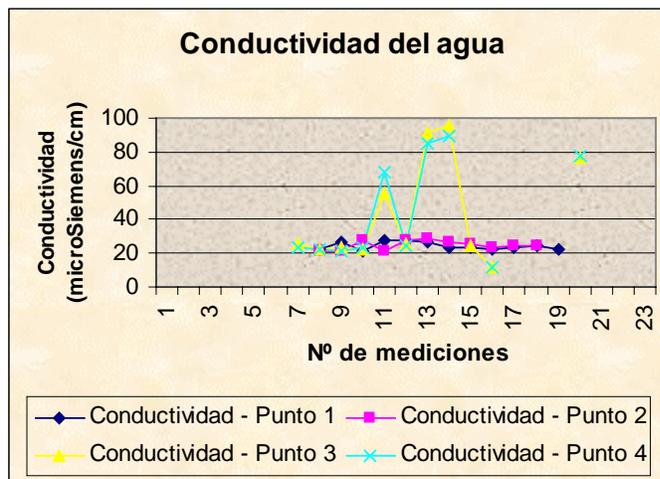


Fig. 10. Variation of the conductivity of the water though the year in each one of the sample points.

In the conductivity of the water important variations of the channels are observed compared to water of the Chimehuin River. This indicates certain deterioration for effect of the dissolved salts that contain (coming from the haulage of silts). But in all cases the water is very pure because most of the points are under the 50 microSiemens/cm that is the value of the snow. This would be a good area for the installation of that electronic factories require free of impurity water. As it need less treatment would be not it would be less expensive.

6. Alkalinity

Sample points: All the points.

Method: A kit HANNA Mod HI 3811 is used.

Objective: To know the alkalinity of the water and to study its variation though the year. To know their interaction with other measured parameters. To determine sources of indirect contamination.



Importance of the measurement: The alkalinity is the measure of the resistance of the water to lower the pH when they are added acids. Levels among 100-200 mg/l CaCO₃ can stabilize the pH. The acids can come from the rainwater or from the snow, although some sources of the ground are more important in some areas. If they are able to reduce the pH of the water it can reach at dangerous levels for the aquatic life. The alkalinity is formed as the water dissolves the rocks that contain carbonate of calcium, as calcite or calcareous stone. Values below 100 mg/l. are considered little alkalinity.

Results:

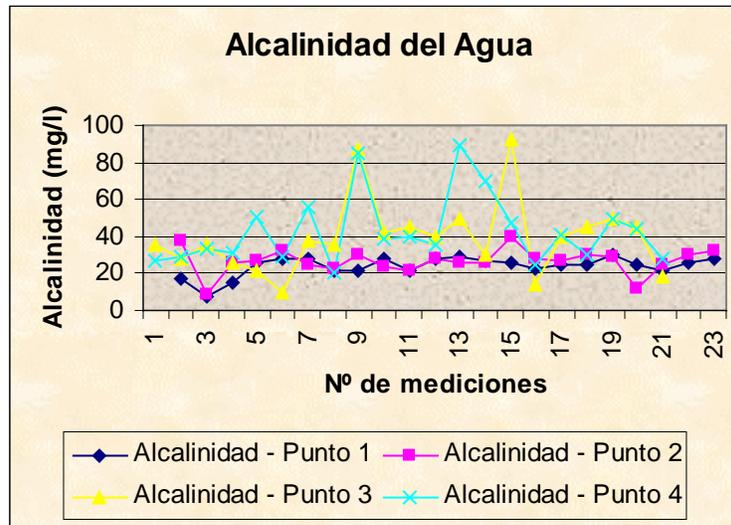


Fig. 11. Variation of the alkalinity of the water through the year in each one of the sample points.

The alkalinity is low in all the sample points; in the channels it is a little higher and with great fluctuation. In all the cases it is inferior to 100 mg/l. This indicates that if there were an acidification of the water for some type of contamination, the low alkalinity would not be able to stabilize the pH.

7. Nitrates

Sample points: All the points.

Method: A kit HANNA Mod HI 3874 is used.

Objective: To know the nitrates of the water and to study its variation through the year. To know their interaction with other measured parameters. To determine sources of indirect contamination.

Importance of the measurement: The aquatic plants and the algae need to grow three essential to the nutrients: carbon, nitrogen and phosphorus. The nitrogen and the phosphorus act as restrictive the growth they are in quality of less quantity.

The nitrogen exists in the water in multiple ways: Dissolved molecular nitrogen (N_2), compound organic: ammonia (NH_4^+), nitrite (NO_2^-) and nitrates (NO_3^-). Of all the nitrates they are the most important. The nitrogen excess in the water promotes the growth of aquatic plants and algae that it can even arrive to the eutrofication (it causes problems in the aquatic life and in the domestic use of the water).

The nitrogen excess in the water almost always comes from discharges of sewers or of the haulage of fertilizers on the part of the rain.

Most of the natural waters have less than 1 mg/l of nitrates, but they can be superior concentrations to 10 mg/l in some areas.

Results: All the results were smaller than 10 mg/l because the sensibility of the used method was of 10 mg/l. In the next measurements we need to use a more sensitive method.

Relation among parameters:

1. Temperature/pH

A tendency doesn't exist between the changes of temperature and changes of the pH in any of the points.

2. Temperature/Dissolved Oxygen

A tendency doesn't exist among the changes of temperature and changes oxygen dissolved in any of the points. In the case of the channels the points are dispersed a little more.



3. Conductivity/Alkalinity

When relating the conductivity so much with the alkalinity in the point 1 (Chimehuin River). As in the point 2 (Canilla huerta chica) the values oscillate around 20 in both cases, ending up being observed a unification of the measurements.

In the points 3 and 4 that correspond to the channels the values are totally dispersed, without following any ser tendency.

4 - pH/Alkalinity

As in the previous relationship points 1 and 2 have small tendency to maintain the pH among 6.5 at 8.5 with an alkalinity of 20 mg/l, while in points 3 and 4 the values are dispersed.

Conclusion

Considering the results one can conclude that the quality of the water is excellent in Chimehuin River at San Cabao Valley, mainly the water of the river (point 1) and of the spool (point 2). At this height the water deviates for consumption at the school (CEI "San Ignacio").

In the water of the channels: point 3 (Huerta Grande) and point 4 (Pastura) some deterioration is observed due to the scarce flow and is great exposition of the haulage of silts. Since this water is used for the watering of the vegetable gardens and pastures the observed variations don't have a great impact on the cultivations.

Country Report

The Kingdom of Bahrain

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Introduction:

On June 16th, 2001 The Kingdom of Bahrain signed an agreement of participation in the GLOBE Program. His Excellency Dr.Mohamed Bin Jassim Al Ghatam, the Bahraini Minister of Education and the U.S.Charge'd'Affairs Joseph Mussomeli signed the bilateral agreement. The Ministry of Education is responsible for the coordination and introduction of GLOBE activities in all schools in The Kingdom of Bahrain. The U.S.Embassy in Bahrain has given us broad support, both financially and morally.

To initiate the GLOBE Program in Bahrain, a team of local environmental specialists and educators was formed. This team helped the Country Coordinator in organizing the initial training for GLOBE teachers and students.

Bahrain being the only island state in the Arab world is very concerned about it's environment and major conservation programs are under way. In line with The Kingdom's environmental strategy and to increase environmental awareness among young people, the leadership decided to join the GLOBE family.

The U.S. Embassy played major role in introducing GLOBE to officials in the Ministry of Education. However, once the introduction was made, the Minister of Education was immediately interested and gave his directives to pave the way for Bahrain's full participation in this important program.

GLOBE Schools

One pioneer school (Khawla Girls Secondary School) started in June and then 6 more schools joined the Program in March 2002. The U.S. Embassy provided the measurement kits for all the schools. The first school started submitting data on November 24, 2002, while the other schools couldn't submit any data because of the final exams. They will start their activities by next September.

GLOBE Bahrain Activities in 2001-2002

-On September 25,2001 a Seminar was held at Khawla Girls Secondary school for the administration staff, teachers and students to introduce the program and its objectives.

-On October 2,2001 a familiarization visit to the Meteorology Center was organized for the GLOBE teachers and students to train them on the usage of atmosphere measurement kits.

-Two Internet workshops were held at Khawla School where teachers and students were trained how to access the GLOBE program website and how to enter the data and information into the system. These workshops were conducted by the Information Resource Center

Director, Mr. Waleed Elmawieh from the U.S.Embassy and took place on October 23rd and 30th 2001

-On November 6-7, 2001 the First GLOBE Training Workshop was held at the Arabian Gulf University and Al Areen Wildlife Park in cooperation with the Ministry of Education, The U.S. Embassy, the Meteorology Center, Arabian Gulf University and the Al Areen Wildlife Park.

-On November 10, 2001 a study site for the atmosphere investigation was established in Khawla School in cooperation with the U.S. Embassy and the Meteorology Center.

-On November 20, 2001 a study site for the soil investigation was established in Khawla School.

-On November 21, 2001 a Training Workshop was conducted by the engineer Mr. Abdul Jalil Mirza and Mr.Jalal Al Mansoor from the Ministry of Power and Water to train the students on how to take measurements of distance.

-On November 24, 2001 the GLOBE Team at Khawla School began submitting data to the GLOBE Data Archive through the Internet.

-On November 30, 2001 an observation and exploration trip was organized for GLOBE teachers and students to Al-Areen Wild Life Park.

-During February 7-12, 2002, a GLOBE Bahrain delegation from Khawla Girls Secondary School participated in the First GLOBE Regional Training Workshop held in Jordan. This trip was part-sponsored by Gulf Air and Batelco.

- On March 2,2002 a Web Chat was organized between GLOBE Bahrain, Jordan and Lebanon. Students exchanged views and observations on the environmental conditions and issues of the three participating countries.

-From March to June 2002, an on-going comparative study of the characteristics of seawater in the Arab Region was conducted in cooperation with GLOBE Jordan and Lebanon.

-On March 12, 2002 GLOBE students visited the Laboratory of the Water Distribution Directorate to be trained how to take the hydrology measurements.

- On March 26,2002 a seminar was held for the new GLOBE schools to introduce the program and its objectives at the GLOBE Center at Khawla School.

-On April 3, 2002 a GLOBE Training Workshop was held at Khawla School for the new schools on the Atmosphere and Soil investigation.

-A day trip to Hawar Island was organized where students took samples of seawater from the different points of the island. Several workshops and lectures were held during the trip.

-On June 16-17, 2002 a preparation meeting was held in Jordan for the GLOBE Country Coordinators in Bahrain, Jordan and Lebanon to discuss the second Regional Hydrology Conference and Training Workshop.

-On July 1-5, 2002 GLOBE Bahrain delegations from Khawla Girls Secondary School participated in the second Regional Conference and Training Workshop held in Lebanon where the students gave presentations, discussed the results of the study, made suggestions and recommendations. During that time, a training workshop was scheduled on Remote Sensing and Land Cover.

Special Events:

-On December 25, 2001 a clean-up and tree-plant day was organized around the GLOBE study sites at Khawla School.

-On February 5-6, 2002 the GLOBE Program and related activities were presented at the sixth Secondary Schools Conference at eight different schools. GLOBE was selected as one of the five best teaching programs in Bahrain.

-On February 5-7, 2002 the GLOBE Program participated in the Technology and Communication in Education Exhibition held at the Ministry of Education Hall in Bahrain.

- On April 22-24, 2002 the GLOBE Program gave a presentation at the Human Resource Development Exhibition at the Gulf Hotel Conference Center.

The Future plans:

- Increase the number of GLOBE Schools in The kingdom of Bahrain from 7 to 22.

- Keep GLOBE schools active in collecting and reporting data.

- Participate in the GLOBE Learning Expedition in Croatia in 2003.

- Continue developing the joint hydrology research project in cooperation with GLOBE Jordan and Lebanon.

- Conduct a new joint MUCathon project in cooperation with GLOBE Jordan and Lebanon.

- Organize the third Regional Training Workshop to be held in The Kingdom of Bahrain in February 2003.

- Conduct a discussion of the results of the MUCathon project at the February 2003 Training Workshop.

- Present the Hydrology Research results from GLOBE Egypt during the third Regional Workshop.

- Develop the contacts with other GLOBE Programs in the Arabian Gulf in order to explore areas of possible collaboration.

Country Report

Cameroon

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Background

The GLOBE Program in Cameroon is in her third year and has made substantial progress. The program has moved from the initial ten pilot Globe schools in January 2000 to twenty globe schools by June 2002. Many more schools have indicated their interest to join the program but for now have to wait for globe science kits to be made available before they can join the program. Some schools are using the protocols to teach science in their classrooms. Both urban and rural schools are targeted for the third phase in which we intend to move from twenty to forty Globe schools.

Globe Activities

The GLOBE Program MINEDUC activities this year have been geared towards an increased participation of the central and school administrators, globe teachers and students.

At the level of the Ministry:

The minister of education has increased her commitment in the Globe program shown by the following achievements:

1. Increased central team for a better management of the globe schools.
2. Provision of Globe office in the ministry
3. Provision of office equipment and internet connection for easy data reporting.

The international training workshop in Yaounde from April 9 –12 2002 attracted support from:

- Globe Washington - the representative for the African desk (Becky Boger) was present as a resource person at the training workshop.
- US Embassy and Peace Corps Cameroon – valuable human resources present at the training workshop. The US Ambassador to Cameroon George Stapples, at the opening ceremony of the workshop said, “This type of cooperation enhances the long-standing friendship between the United States and Cameroon, encourages international understanding and helps the American Embassy meet one of our primary goals: helping Cameroon develop its economy without sacrificing the environment.”
- The Minister of National education at the opening ceremony of the training workshop reiterated, “ The GLOBE Program MINEDUC international training workshop is an annual event that I personally look forward to. It gives me the special opportunity to meet our international partners to harmonise our vision in a bid to improve on the teaching and learning of science and research in our institutions as well as studying and understanding our environment.”

- Two schools in Yaounde; CIS Bastos and GBPHS Yaounde presented songs and a drama at the opening ceremony of the international training workshop (see audio-cassette).

At the level of the GLOBE schools:

Head teachers of Globe schools are gaining interest in the program as a pedagogic tool. They welcomed with enthusiasm their participation in the training workshop where many, for the first time, had an overview of the GLOBE Program and a hands-on experience in the internet; with emphasis on the GLOBE web page and Cameroon globe schools status. Of the twenty globe schools we have slightly above fifty percent reporting regularly. GLOBE Program MINEDUC cannot expand rapidly to meet the all the demands. Some private schools such as Cameroon International School Bastos, having acquired GLOBE material, have received support in training of GLOBE teachers. This is the first primary and private school in the GLOBE Program MINEDUC Cameroon. The teachers and student are gaining skills not just in science research and math but also in language as shown in the poem from the students newsletter GLOBE CALL edited by Peace Corps Volunteer Micheal Garcia of the Bamenda Teachers' Resource Centre, March 2002.

Our action plan for the 2002/2003 school year includes:

- expansion of the program to include forty GLOBE schools;
- explore research opportunities with local and international partners;
- creation of a GLOBE Program MINEDUC database and website to encourage local and regional networking as well as research;
- Prepare Cameroon globe students' participation in the Global Learning Exhibition in Croatia 2003.

GLOBE Program Cameroon looks forward with a lot of expectations and determination to accomplish her goals for the 2002/2003 year.

GLOBE CALL! GLOBE CALL!

Calling all GLOBE Students! Now you can share your experiences with other GLOBE participants in the province, the country of Cameroon, and even in other countries. You ask, "How can I do this?" It's easy! Just tell us about what you are doing with GLOBE at your school. Write stories, poems, jokes, interviews, or anything about your experiences with GLOBE. Submit these to your GLOBE teacher and they will be incorporated into the Provincial GLOBE Newsletter. As this newsletter circulates your words will reach around the globe!

Our first entry is a poem sent by an alert GLOBE student, named Tindatie Windaline, from GBHS Ndop.

Globe Call, Globe Call

Globe call, globe call,
We acclaim you because you adorn our environment,
You are acute and accurate, none can ponder like you,
Your results are true and decisions clasp,
Your doctrines are interesting and receipt teaching,
You are global and so deal with the globe,
We appreciate and recognize your dynamic environment.

Globe call, globe call,
You that leads to global promulgations,
You are our pride, just as the well swept veranda
Is the pride of the householder. You are the students
Pride just as the beautiful woman is the pride of her
Husband. You are on your way. Yes on your way.

Globe call, globe call,
Tell me all that happens in the environment.
Will there be rain soon? Or no rain at all today?
Yes you laugh and say until my Stephenson's Screen predicts
You cannot know so don't bother. I will give you facts
As long as you rely on me. Just be courageous
And keep reading always and see how you will know more.

Globe call, globe call,
Has the Stephenson's screen, a screen of talent
It has been working always, working
In the morning, working at night,
Working all day, all times, all hours, all seconds,
Just to benefit the environment.

Globe call, globe call,
You are working for us your students,
Toil for us your readers,
Working and yet will never be wrinkled or sunk
Gentle breeze is the father of rain,
Soft wind is the father of cloud bursts,
Globe call is the father of our pride.

Globe call, globe call,
There is something about you that no one else has,
You are the world's model and doing a noble act of faith,
Moulding our minds to have a knowledge about our environment,
And take worthy place in the society. You have
Taught us about environmental facts. You have sustained
Environmental learning and observation. You have spear-headed
Hydrological statistics and have encouraged the observation of clouds.

Globe call, globe call,
You are more of global investigations,
Making Nature refreshing and
Weather readings our priority. We
Know it to be safe. Do it to be wise
Practice it to be beneficial. Yes
It contains facts to direct us,
Food to support us, comfort to cheer us and our charter,
Many more years to you.
Oh global learning and observations to benefit our environment.



Country Report

Canada

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The governments of Canada and United States signed an MOU for cooperation in the GLOBE Program in Canada on April 7, 1997.

In August 1999, Canada hosted its first GLOBE International Training Workshop where 12 Canadians from 4 provinces and territories were trained in GLOBE protocols. These trainers set off to train others and enlist more schools in The GLOBE Program.

In June 2001, Canada appointed a Country Coordinator. This position was part of a “pilot project” which would run for 10 months building on the efforts and successes of past and ongoing GLOBE initiatives in Canada.

Trainer Workshops:

Canada became a partner in the 4-year GLOBE-NILU Arctic POPs project at its inception in 2001. Summer 2001 saw many of the northern teachers participate in a first training workshop in Fairbanks, Alaska. Teachers from around the circumpolar region attended. Field sampling for local fish was conducted in the fall and spring by the three participating high schools in Canada. The GLOBE-NILU Arctic POPs project is a significant program in Canada’s North as the issue of contaminants in the Arctic is of paramount concern. Indigenous peoples are exposed to health risks through their consumption of country (wild) foods. Canada looks forward to continuing with further training this August at the workshop in Akureyri, Iceland and the following sessions of field sampling with the students.

Canada hosted an international training workshop in August 2001, at Kananaskis, Alberta. Fourteen teachers from across Canada received training, in addition to 3 international participants.

GLOBE Trainers:

As a direct result of the two training workshops, and in association with the Country Coordinator, Canada was well positioned to provide extensive teacher support and outreach. Trainers, returning to their region of Canada, spread the word of GLOBE to administrators and other teachers. The momentum of GLOBE in Canada is a credit to the many GLOBE trainers

and teachers who put their personal energies into the Program, promoting it at conferences, professional development events, and one on one with other teachers.

In Canada, education is the responsibility of each province and territory, it is not a federal responsibility. This arrangement presents challenges when an educational program such as GLOBE is brought to Canada at the federal level. Provinces and territories must endorse the program on an individual basis. With this situation, and in so large a country as Canada, it is very important to have a network of regional GLOBE trainers, to support the teachers and students “on-the-ground”. This allows the Country Coordinator to network through them to teachers, and to garner support for the program from various agencies and ensure the sustainability of the program. An organized network of GLOBE trainers is key to GLOBE’s success in Canada.

Trainers conducted GLOBE workshops in various locations throughout the year.

Across the Country:

A GLOBE trainer in Arctic Canada has initiated a study on arctic haze with his students. Another teacher in the Arctic conducted GLOBE measurements in association with the Northern Climate Exchange in a project he designed studying ice at the flow edge. Several teachers are using data loggers to record temperature data – air and soil.

Manitoba is gearing up for a GLOBE pilot project – matching specific GLOBE protocols with specific grades and their respective curriculum. Manitoba is training this summer for the upcoming school year.

In NWT, talks are ongoing to establish a NWT GLOBE coordinator. In Yukon, a veteran teacher retained on contract is used to provide one-on-one support to teachers doing GLOBE and other environmental education programs. GLOBE serves as a framework on which to hang other EE initiatives and a compliment to other programs, such as Canada’s Plantwatch.

Support from the GLOBE International office has been tremendous and a large part of the success of GLOBE in Canada.

What’s Ahead?:

The “pilot project” which appointed the Country Coordinator concluded in late March, 2002. Environment Canada, Industry Canada, and the Department of Foreign Affairs and International Trade will make a decision at the federal level, as to how to proceed with GLOBE in Canada. Financial support continues to be an issue. And always there is the complexity of education not being a federal responsibility. Despite this, GLOBE remains a critical educational program in Canada, particularly in the North. In other regions, such as Calgary, Alberta, and Manitoba, and individual teachers elsewhere, GLOBE appears to be sustaining, by virtue of the uniqueness and capacity of the program.

Country Report

Cape Verde

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Introduction

In August 9, 2000 the National Oceanic and Atmospheric Administration of United States of America and the Ministry of the Foreign Business of the Republic of Cape Verde agreed to cooperate in the Global Learning and Observations to Benefit the Environment (GLOBE Program).

During about two years, several constraints, in particularly, the non-definition of the modalities of implementation of the program and the creation of conditions for the Ministry of the Education, didn't allow the coordinator nominated, to participate in the trainings for Globe trainers.

In March of 2002, takes place a training Workshop for trainers in the University of Howard, in Washington, an initiative assumed by the Historically Black Colleges Universities (HBCU) and the African partners of the Globe program, with the aim of promote and consolidate partnerships among universities, students and teachers of the primary and secondary levels among the two continents. This workshop, financed by the NASA, through the program PIPELINES, allowed the participation of Cape Verde for the first time in a Training Session.

In this training participated a secondary teacher invited by the Ministry of Education of Cape Verde, responsible for the Globe program implementation in Cape Verde. The teacher participation was due to the fact that she has presented in her school a project for the creation of an ecological club and that probably could allow reaching, among others, the aims of the Globe program.

After her training it could be established a bridge among the headquarters of the Globe program in the USA, the HBCU, the African countries and the Ministry of the Education of Cape Verde and consequently a new dynamic that allowed, among other, to analyse the implementation of the Globe program in Cap Verde.

Accomplished Activities from April to June

In April, soon after the end of the training the participant discuss with the Ministry of the Education, some of the staff and teachers of Training Teachers Schools that trains teachers for secondary and elementary level, but also teachers from the school she belongs for the importance of implementing the Globe program in Cape Verde. In a second phase, she presented to the Ministry of the Education a plan of activities for the school year 2002-2003 (to see enclosure).

The participant continues to maintain the communication, through Internet, with the Globe program headquarters in Washington, Southern University and A&M College (HBCU), coordinators and participants that participated in the Howard Workshop in Washington, to answer to solicitations and to raise suggestions and to debate with them views and ways to implement the Globe program in Cape Verde, but also to establish future collaborative projects and cooperation among the two continents.

The participant maintained continued contacts with the Ambassador of the USA in Cape Verde that manifested its interest and unconditional support to the implementation of the Globe program in Cape Verde.

The Embassy of the USA in Cape Verde supported the teacher in terms of her participation in the Workshop of Howard in Washington and manifested its agreement in supporting some schools in the acquisition of informatics equipment and instruments for the Globe scientific data collection, among others. The Embassy of the USA made possible the meeting between the participant and the commission of Miss Cape Verde of New England. The participant showed interest in contacting the cape-verdean community in the USA with the view to seek funds that allow her to support the Globe program implementation.

The responsible for Cape Verde in the Globe program headquarters came to Cape Verde in April for contacts with the Ministry of the Education and also was suggested by the participant meetings with some national investigation institutions, what was accomplished by the support of the Embassy of the USA. During its permanence took place a workshop for teachers in the 17 and April 18 with the view to a first information and sensibility of the Globe program. In this workshop participated two elements of the Peace Corps in Cape Verde that manifested interest in participating in the program. Meetings with the participant also allowed debating the modalities of implementing the Globe program in Cape Verde.

During her permanence in Washington the participant had meetings with professor Dr. David Brooks, Principal Investigator of Globe Aerosols Project who manifested interest in having Cape Verdean data in this field. The participant accepted to collect the data. Thus, Dr. Brooks gave to the participant a photometer and a voltmeter. The participant got at INMG thermometer so she could begin the data collection and transmission. This work demanded a continuous communication with Dr. Brooks who constantly supported the participant, through internet, following the protocol measurements. Dr. Brooks will present first phase of this investigation work in the Annual Conference of Chicago in July.

During her permanence in Washington, Dr. Ousmane Koita, Chief of the Laboratory of Applied Molecular Biology and teacher of the Department of Medicine, Sciences and Technology of Mali, presented an investigation project that was made in Mali, and whose results was pointed for an existing relationship between the UV rays B and the increase of the incidence of malaria. Dr. Ousmane Koita showed interested in enlarging this study for Cape Verde. Thus, the participant facilitated the communication through internet with the responsible of PNL (National Projecto Against Malaria) with view to an eventual investigation project and collaboration.

Constraints

These activities were accomplished with the view to create a dynamics that allowed the taking of decisions for a real implementation of the Globe program in Cape Verde and, they were possible thanks to the personal engagement of the participant that gave her own means to keep the bridge between Cape Verde and Howard in Washington.

However, commitments with her school and the lack of definition of her role in the Globe program, didn't allow the teacher to maximize the contacts with the national investigation institutions and Training Teachers School, because the contacts were not official.

Conclusions

The coordinator's nomination was necessary and it came true in May 16th by the decision of the Minister of the Education to assume the full time coordination starting from September 2002 in the General Directorate of Basic and Secondary Education, as institutional focal point of the Globe Program.

Starting in September, the activities programmed in the approved action plan for the year 2002-2003 will be accomplished (to see enclosure).

Accordingly with the action plan, it is foreseen for November, a training in the protocols of Atmosphere and Climate for teachers of the primary and secondary level and also for teachers of the Training Teachers School. The execution of the referred protocols is foreseen for three primary schools and two secondary schools in the beginning of 2003. In the primary schools it is intended that the execution of the protocols be accomplished inside the school schedule while in the secondary schools it should be accomplished through ecological clubs (still for implementing) as extracurricular activities. The translation for Portuguese of the Globe didactic materials should be accomplished along the years 2002-2003.

During this year (2002) it intends to promote partnerships among investigation institutions, schools of teachers training from Cape Verde and the Globe partners with a view to establish investigation, collaborative and cooperative projects.

It is intended to elaborate a plan of extension of the Globe program in Cape Verde with a view to the extension of the program to more schools and other islands of the archipelago and also the introduction of the program in the curriculum as a way to guarantee its continuity.

However, the success of the Globe program in Cape Verde will depend in a large part of the readiness of funds. General Directorate of Basic and Secondary Education doesn't have specific funds for the program Globe as it works with a restrictive budget. Thus, one of the priorities during the year 2002-2003 will be the search for financing and/or necessary supports for the implementation of the Globe program in Cape Verde.

Experimental Plan– Program Globe 2002/2003

Activities	Period	Population Target	National institutions involved	National Partners	International Partners and Community CV - E.U
1) Definition of the structure of coordination	May 2002		M.E/D.G.E.B.S		
2) Implementation infrastructure for coordination	May / Jul. 2002		M.E/D.G.E.B.S		
3) Training	Nov. 2002	Teachers of E.B.I (3) Teachers of E.S (6) (Santiago) Teachers of I.P (2) and I.S.E (3) Total - 14	Ministry Education / D.G.E.B.S Coordination Prog Globe - I.P - I.S.E		- Headquarters Program Globe Washington - Partners of H.B.C.U / SUBR / E.U.A - Partners of African countries
4) Translation of the material Globe- Port.	Sept 02 / Dec. 03	Teachers and Students	ME/D.G.E.B.S CPGlobe		
5) Acquisition of equipments	Nov/Dec. 2002	Students of E.B.I and E.S	ME/D.G.E.B.S CPGlobe	- Institutions Research	-Embassy E.U.A -Community CV-E.U - others
6) Implementation of ecological clubs (2) (*) in two high schools (Santiago)	Dec. 02 / Jan 03	Students of the E.S	ME/DGEBS / ACACEA CPGlobe	- Pres. CV - Ass. Nat. - Inst. Resea. - Shell - Enacol	- PNUD - UNESCO - UNICEF - others
7) Implementation Protocols (Atmosphere and Climate) 7.1 – Directly in the classroom 7.2-Through ecological clubs (2)	Jan. / Dec. 2003	7.1- Students of E.B.I (90) 7.2- Students of the E.S (40) Total - 130	ME/D.G.E.B.S C.P Globe Schools of the E.B.I (3) (Santiago) High schools (2) (Santiago)	- Schools of the E.B.I and E.S - CV Telecom - Pres. CV - Ass. Nat. CV - Inst.Research. - Shell - Enacol	- PNUD - UNESCO - UNICEF
8) Information and Promotion of Partnerships (with view to establishing a plan of research and others collaborations)	Set.02 / Dez.03	8.1- National Researchers and Teachers of I.P and ISE 8.2-Public	ME/D.G.E.B.S C.P Globe	Newspapers Radio Television	- Partners of the H.B.C.U/SUBR / E.U.A - Partners of African countries. -Researchers of Globe
9) Evaluation	Nov 02/ Dec 03		ME/D.G.E.B.S C.P Globe		Headquarters Programs Globe Washington
10) Development Plan of extension Program Globe	April/May 2003		ME/D.G.E.B.S C.P Globe		

(*) I suggested that the implementation of the ecological clubs will be done by ACACEA in partnership between ME / D.G.E.B.S and Program Globe Coordination CV.

ME- Ministry of Education
DGEBS- Management of Education for Primary and High School
I.P- School for training primary teachers
I.S.E- School for training secondary teachers
ACACEA- Association (ONG) for Environnemental Education.

Country Report

Chile

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Since 1999, the Ministry of Education of Chile has sponsored this GLOBE Environmental Education Program, primarily aiming at bringing science closer to students by means of the observation of local environmental events affecting the global ecosystem.

The most important event for GLOBE Chile in 2002 has been to complete 30 schools across Chile from north to south. This event was possible because the professionals of Ministry of Education put your effort in working together an important government and private institutions.

Last January 30, the Minister of Education, Mariana Aylwin, visited El Hueñecito School at La Pintana municipality. This is one of the schools were this initiative has been already implemented in Chile. There she saw the type of experiments conducted by the students and the way these activities enhance learning of science and build environmental awareness.

The Minister of Education and Hewlett Packard's General Manager, Edgar Witt, also signed a Collaboration Agreement to implement the GLOBE program in 30 underprivileged schools along the country, supported by recycled PCs, brand-new HP printers, and ink supplies for one year.

This equipment will act as an incentive for using new information and communication technologies as a tool to support GLOBE and build a network among the various schools that will collaborate remotely.

Shell Chile Company have been supporting Hewlett Packard's initiative to bring technology closer to people and help closing the digital divide by providing the first 15 PCs disposed of by the organization that HP will refurbish and configure.

On the other hand, the Ministry of Public Build will supply the remaining meteorological stations, so that 30 fully equipped schools will be ready to operate in 2002 under GLOBE; these additional stations will be implemented in those regions that are still unrepresented.

Special GLOBE News

✓ School to Science Collaboration

The GLOBE program in Chile will provide opportunities for school collaboration this year. The idea is to produce a “Weather and Tree finder Pocket Guide” with all GLOBE schools with special participate of the students. The Guide will be for children and will make for children too. The teachers role will be to guide and coordinate the student work and investigation.

An professional team of Ministry of Education and Ministry of Public Build will edit the information and a group of universitary students will support the school to obtain a very good investigation document and, finally, a very good guide.

✓ Workshop in El Quisco Beach

In october 2002, we will have a GLOBE workshop in El Quisco beach, Region of Valparaíso-Chile. The guests will be Chilean GLOBE teachers coordinators and Latin-Americans coordinators.

That activity will have a duration 10 days aprox. The workshop will be in “Cabañas Banco Estado – El Quisco”, this place is within walking distance of shopping, restaurant and beach. It will be Spring, the temperature vary to 10°C - 22°C. Maybe could rain too.

The cost of full service is US\$70 aprox. diary (bed and food- american breakfast and meal-). Bed in departments to share out between 4 persons.

Conclusion

Through the GLOBE Program we are learning more about the earth (our Planet) and particularly how to collect and interpret data and think about relevant hypotheses like scientist.

Under the supervision of teachers, students collect water and soil samples, carefully monitor weather, and the preservation of vegetation. GLOBE is helping us to understand the global challenge.

“Education is a task for us all. If we want our country to progress, we all have to fulfil our responsibilities and the private sector has a fair share in this. Everybody collaborates in this school and kids are learning more and better”, said Minister Mariana Aylwin.

Country Report

Croatia

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Program Support- Retention of Schools/Teachers

After six years of GLOBE implementation in Croatia there are some aspects with which we could be satisfied and proud of, as well as some other which make us worried and not so pleased with. As regards the latter aspect the question of retention of schools / teachers is one of the issues. Present situation is: Out of 111 Croatian GLOBE schools, 69 make regular reports, 24 haven't started yet, 18 had been reporting in the past.

What were the reasons for interruption of data reporting in 18 schools and does that mean stopping of all GLOBE connected activities in those schools?

I was investigating that problem again during May and June this year, as well as on several occasions during recent years. It appeared that there might have been some technical reasons for stopping the data reporting, e.g.: instrument shelter, or some instruments have been broken, Internet connection has been disabled.

The other group of reasons is always related with GLOBE teachers:

If there is just one GLOBE teacher, and he/ she is absent on temporary or permanent bases or in other way disabled for the organization of the data collecting and reporting, GLOBE program stops. We had two examples when older (16 - 17 years) GLOBE students have continued with data reporting without assistance and supervision of GLOBE teacher for several months. Of course, this just couldn't last longer without real teachers' support. All the above mentioned examples illustrate that GLOBE teacher is the most fragile and most precious element of GLOBE structure.

Further research of "*have been reporting in the past* school category", revealed that in some cases teachers did not get sick or did not leave the school but had stopped working in GLOBE. Why? All possible reasons could be summarized in one statement: They did not get enough support or recognition for their enthusiastic work.

Let's face the fact: GLOBE teacher has to be enthusiastic. But, enthusiasm could get exhausted or spent in time. GLOBE teacher has more work to do – that is for sure. If we put this fact on one side of balance, there should be enough "weight" to put on the other side, in order to keep him/ her going. That could be greater satisfaction or pleasure in work, recognition by others, higher self esteem, fulfilling of personal interests and ambitions..... So, if there is enough weight on that, other side of balance, we could keep the teacher in GLOBE for many years. In that sense

Chief scientist's letters of recognition play very important roll and represent great contribution to GLOBE implementation success.

In order to support and encourage teachers, we organize events/ situations where Croatian GLOBE teachers can meet at least two times durring one school year. Ministry of Education and Sports organizes these meetings, which are the combination of TT (learning of new GLOBE protocols, refreshing old knowledge, science lectures, field work, didactical innovations – learning activities, workshops for improving computer skills and communicational skills) with symposium type of meeting (experience and good practice exchange, discussions on chosen topics or actual questions). We place a lot of attention and efforts in two aspects of these meetings: teachers must feel that the participation was beneficial for them in terms of their regular subject teaching. In addition they should experience good, comfortable and friendly atmosphere. Therefore we are very open for their suggestions concerning future meetings and in planning the agenda for each of the meetings.

Decision on teacher's attendance of the meeting is subject of his/ her own will, as well as head master's readiness to cover travel expenses. Those head masters, who accept and value exceptional status of GLOBE school, usually do not make a problem out of it.

The third occasion for meeting and presentation of individual school results, are annual GLOBE students' & teachers' conferences. The main aims of the conferences are to encourage the use of GLOBE database and GLOBE measurements in students research projects. Schools' GLOBE teams, which carry out only data collecting activities, are usually "fed up" after certain scope of time. Consequently the relevant activities cease to exist.

The conferences are financed by the Ministry of Education and Sport, which unfortunately implies limited number of participants (up to 200). Only active schools are eligible to be represented by one teacher and three students. More representatives per school are accepted if the school covers their expenses. An invitation for annual conference is considered to be a credit and motivation, both for GLOBE teachers and students. Certain number of schools receive awards for successful implementation of GLOBE activities, for exceptional presentation of their work in GLOBE (posters and computer presentations), for research project or for winning GLOBE competition. Those awards contribute to GLOBE teacher and students recognition within the school and in local community. According to teachers, students are keen to participate in GLOBE conferences due to the low level of pressure comparing with other similar competitions. Therefore, there is general problem of selecting just three students per school.

Very important factor in sense of retention is also the program image. As long as GLOBE program is presented in public in an affirmative way, the interest for it grows. After six years of hard work in the field of marketing, we do not have to draw attention of new schools – to put extra efforts in recruiting new teachers. Many teachers are familiar with the program and they join the preparatory activities which are organized once a year. At that point, the head masters new candidate schools are able to understand that participation in GLOBE is privilege rather than just obligation and extra work. Once they see it as a privilege and good contribution to the school image, the procurement of necessary equipment, Internet access and allocation of funds for GLOBE teachers travel expenses, do not stand as significant problem any more. Those head masters usually take care to provide GLOBE training for more than one teacher, which is very important step in retention insurance.

Country Report

Czech Republic

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Introduction

The GLOBE Program in the Czech Republic started in April 1995. On April 22nd we celebrated not only the 25th anniversary of Earth Day but also the start of the GLOBE Program in our country. Students with their teachers and guests were rolling a huge three-meter wide globe, a symbol of Earth Day and the GLOBE Program through the narrow Prague lanes. Students from 25 localities in the whole country came to Prague with their one-meter wide globes, which were decorated with their messages, expressing their worries about the future of the planet Earth. Students passed their messages together with decorated globes to invited personalities from the government, business sector and science, stressing to them their responsibility for the environment.



In the Czech Republic the official guarantors of the GLOBE program are the Ministry of Environment and the Ministry of Education. TEREZA, Association for Environmental Education is the National coordinator of the project. TEREZA is a non-profit, non-governmental organization. The following institutions cooperate on the project: Science Faculty and Pedagogical Faculty of Charles University, Czech Hydro-Meteorological Institute, Botanical Institute Academia of Science. TEREZA cooperated closely with the U.S. Peace Corps at the beginning of GLOBE but unfortunately they finished their work in the Czech Republic in June 1997.

In the Czech Republic 93 schools take part in the GLOBE Program, of which there are 49 primary schools, 37 secondary schools and 7 groups of children from hobby clubs. Since April 1995, two international and ten Czech GLOBE training workshops have taken place in the Czech Republic. All together 170 teachers and 20 volunteers from US Peace Corps participated in them.

TEREZA tries to ensure the basic aids and tools for the schools so they can begin measuring as soon as possible. The participating schools receive the maximum-minimum thermometer, hydrological thermometer, pH meter, conductivity meter, professional container to measure rainfall (we thank the Czech Hydrometeorological Institute for providing them), a compass and a magnifying glass. TEREZA bought 6 GPS instruments and started to offer them to Czech GLOBE schools to borrow for two or three weeks.

Internet

In the beginning of the GLOBE Program only about three participating schools had Internet. That is why the schools send their data by fax once a week to TEREZA, which sends them through the Internet so they can be processed. In June 1996, TEREZA and 30 other GLOBE schools submitted a successful grant application at the Open Society Fund and got a grant to cover Internet costs during one year. This is why the number of schools using Internet has increased rapidly to approximately 50 schools. Now the situation with the Internet at schools has greatly improved.

GLOBE Newsletter

As many schools were not connected to the Internet, and did not have any feedback from the project, TEREZA decided to publish a special GLOBE Newsletter which answers the most frequent questions and informs the readers about what is happening in the GLOBE world and at the Czech schools. The participants may write contributions to the Newsletter and inspire each other in this way. The Newsletter is published two times a year.

GLOBE Poster

The GLOBE Poster includes many color photographs and satellite pictures. With this poster in hand, everybody can get a notion of what the GLOBE program is. Each photograph includes a note in both Czech and English. Our teachers and students can use it very well when introducing the GLOBE Program to other students and teachers, local government representatives, business people, etc. It can also serve well in fundraising for GLOBE.

Work Sheets

We published GLOBE worksheets containing various activities and tasks that should enable students to understand more difficult themes or individual connections. The GLOBE worksheets consist of four parts – Introduction, Hydrology, Meteorology, Biometry - each of which includes 10 sheets on average. When preparing them we cooperated with experts from various fields. The pictures from the Czech work sheets drawn by the artist Jan Smolik were given a great honor - the new American manual GLOBE II was decorated with them. Now we are working on the new updated edition and on the fifth part of worksheets – Soil measurements.

GLOBE Scientific Board

On April 16, 1996, the Scientific Board of the GLOBE Program in the Czech Republic was established. Eleven top scientists and professionals from different natural sciences have joined the Board. The Board helps with the work on the materials for both teachers and students, interpreting the data measured and processing the results.

The Czech Evaluation Conferences

Since 1995 we organized 3 Czech evaluation conferences of the GLOBE Program which was attended by principals, teachers and students from GLOBE schools all over the Czech Republic. The greatest surprise of the conferences was the discovery that GLOBE is suitable not only for the so-called study types but also for children with learning disorders.

There are some other interesting findings:

- students use GLOBE measurements in various student science competitions and they are successful,
- students organize the everyday meteorology measurements themselves, GLOBE schools started to organize such GLOBE Days on the occasion of Earth Day and they invite the public to inform it about GLOBE Program,
- students and teachers like to meet and exchange the results of their work personally and that is why Czech GLOBE Games have become so popular.

Special GLOBE Training Workshops

In 1998 we started with special training workshops in Remote Sensing and MultiSpec. As of present we have organized seven workshops (each for two days) in which 43 teachers and 48 students from 43 schools participated. In 2000 we started to organize the special training workshops in the soil measurements.

The Czech GLOBE Games

The GLOBE Games are a meeting of the Czech GLOBE schools, students and teachers. One part of the Games is competition, where the students have some special tasks to fulfill. All the tasks come from the GLOBE Program measurements. Another part of the games is cooperation during the investigation of nature. These games have been taking place since 1998. They have been held in these towns: Valašské Meziříčí (1998), Telč (1999), Humpolec (2000) and in the year 2001 in the town of Kadaň. Every year about 250 students and 40 teachers from 30 GLOBE schools attend it.

5th Czech GLOBE Games in the town Dacice in May 2002



TEREZA organized the 5th GLOBE Games in cooperation with the GLOBE school gymnasium of Dačice. There were in total 250 students and 41 teachers from 31 schools from the Czech Republic. We also could say hello to 2 teachers and 6 students from a Polish gymnasium in Kozminek. The students and the teachers from Poland assimilated very successfully into the GLOBE despite the linguistic handicap they faced.

We were also very happy to welcome visitors not only from The Czech Republic but also from the U.S.A. Professor Barrett Rock, one of the GLOBE Program founders, and Dr. Irene Ladd from NASA visited The Globe Games and was effectively involved in the program itself. This was Dr. Ladd's second attendance at The Globe Games. Last year she visited the Globe Games in Kadaň and brought six ozone scanners with her. She was very satisfied with students' measurements and brought six new scanners for other schools this year. We also were very glad to welcome Czech guests among us: Dr. Jana Albrechtová from the Charles University and Ing. Marta Kubová from the Ministry of Environment. The 5th GLOBE Games lasted for 3 days. Three different programs were prepared—the first one for students-competitors, the second one for “fans-explorers” and the third one for teachers.

Starting with students-competitors, there were 11 different sites to test and try new measurements from The GLOBE Program and to understand their practical use. The “fans-explorers” could choose their specialization and explore the environs in groups guided by experts. The following specializations were options to choose: hydrology, historical, GPS, biology and land cover. The teachers could go and look through all the prepared sites and see their students fulfilling the tasks. On Saturday and Sunday they also could take part in the “field conference”. They had the opportunity to speak both to Prof. Rock, Dr. Albrechtová and Dr. Ladd, and hear a very successful student presentation of GLOBE.

GLOBE Expeditions

It is very important for students and teachers to spend some time out of their school in nature, do some investigation, play games etc. Summer expeditions are a very good opportunity for this. TEREZA organized several expeditions.

Expedition Napapiiri

On the occasion of the GLOBE Learning Expedition in Helsinki, TEREZA organized the Czech GLOBE Expedition Napapiiri (napapiiri means polar circle in Finish language) in July 1998. The bus with GLOBE students and teachers came to Helsinki, with 11 members of the Czech team. Then the bus continued to tour the natural environment of Finland to the North. During the expedition students researched nature, did various GLOBE measurements and sent their results straight to the GLOBE Learning Expedition in Helsinki. Their results were presented during student presentations. After a week the bus came back to Helsinki, picked up the representative team and continued one more week through Estonia, Latvia, Lithuania and Poland before returning home.

Expedition Mediteran

In the summer of 2000 and 2001 TEREZA organized three batches of Expedition Mediteran to Croatia, to the island Krk. Students and teachers investigated ecosystems in the sea and coast, did various activities, visited some interesting places, swam in the sea and took GLOBE measurements.

They also met teachers from the Croatian GLOBE schools – Technicka skola in Daruvar, where lives the Czech minority and the GLOBE school in Rijeka.

Expedition Etna

In October 2001 TEREZA organized the Expedition Etna to Sicily to the volcano Etna. The participants of the expedition had great success because the volcano was inactive during their visit and so they could reach the top of Etna, the highest and the most active volcano in Europe.

Travel Exhibitions of Photos

It is very important to introduce the expeditions and their results to other students, teachers and parents. That is why TEREZA usually organizes special travel exhibitions of photographs taken on the expeditions by renowned Czech photographer Roman Sejkot. During the year, the exhibition travels to each of the GLOBE schools that participated in the expedition. Students and teachers are responsible for the photography exhibit when it reaches their schools and invite guests, such as journalists, mayors, school principals, and teachers from other schools to view the photos.

Czech - Norway GLOBE Cooperation

In 1999 we started GLOBE cooperation with Norway with a workshop that year. Teachers and administrators from seven Czech and seven Norwegian schools met in May in the Czech Republic and discussed and prepared the next cooperation. Next year 6 Czech GLOBE schools will visit their partners in Norway and students and teachers from 3 Norwegian schools will participate in the Czech GLOBE Games in May and the next Norwegian school will come to the Czech Republic. Now the cooperation is continuing and schools organize it themselves.

The Future

- participate in the GLOBE Games in Norway which will be the part of the Czech Expedition Norge for GLOBE students and teachers
- help GLOBE schools with using data
- concentrate more on the quality of the work at GLOBE schools (not on the quantity of schools)
- up-date worksheets for students and the Czech manual for teachers

Country Report

Egypt

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GLOBE Project in Egypt

GLOBE (Global Learning and Observations to Benefit the Environment) began in Egypt with then Vice President Al Gore concluding an agreement with President Hosni Mubarak that Egypt joins the United States and other nations in the **GLOBE** program. This was announced worldwide, on TV, by Vice President Gore on Earth Day, April 22 1994.

The following year, on his official visit to Egypt, Vice President Gore attended the signing of the **GLOBE** agreement between Egyptian Minister of Education, Dr Hussein Kamel Bahaa El Din and the Ambassador of the United States of America to Egypt, Edward Walker.

The aim of the project is threefold:

1. Enhance awareness throughout the world concerning the environment.
2. Increasing the scientific understanding of the earth.
3. Help students reach higher standards in science, mathematics, and computer literacy.

Earth day April 22, 1995 marks the official beginning of the GLOBE programs in 12 pilot Schools in Egypt.

Steps taken for developing the program in Egyptian schools:

Phase One:

Twelve schools were selected as pilot schools for implementing the program

A plan was developed to inform school directors and teachers about **GLOBE** aims and what benefits would be gained by students joining program.

Phase Two:

Seeking private sector support for purchase of measurement equipment, computers and training on activities related to this project which are carried out as follows:

- a – providing schools with the instruments needed for data and measurements collection.
- b- training teachers (Science & computer teachers) to adopt new methods needed to implement this program in schools through their participation in international workshops conducted outside Egypt (USA – Czechoslovakia, and the Netherlands).
- c. - Access to THE INTERNET.

Phase Three:

An Executive Team, chaired by the **GLOBE** country Coordinator, was established in the Ministry of Education and supported by the General Education Sector, in the Educational Computer Department.

The role of this **GLOBE** Team is as follows:

1. General Management for the participation in different activities of the **GLOBE** project in Egypt, regionally and internationally.
2. Organizing local workshops in Egypt
3. Preparing & translating **GLOBE** educational handouts, demonstrating protocols, which are to be followed by students & teachers.
4. Providing schools with required PCs.
5. Organizing periodical meetings with teachers for solving problems when necessary.
6. Training teachers to be familiar with the Internet communication & supporting them technically for on-going Internet access.
7. Following up on all activities in schools and how students benefit from taking measurements on their school sites or in natural places. Measurements are classified as follows (hydrology, biometric, atmospheric). Students take measurements related to real life of the surrounding environment. They then validate data collected before recording. Finally, send data through the Internet to be analyzed by Scientists.

Last May, GLOBE Egypt established a steering committee composed of educators and scientists to act as an advisory board for the project.

Country Report

Estonia

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In total 33 Estonian schools continued implementing the GLOBE program and conducting environmental measurements in school year 2001/2002. By July 2002 the GLOBE data archive included over 241,000 data records from Estonia. Each of five best schools has submitted over 15000 data records. Over 800 students are engaged in various GLOBE activities.

The key words of this year were student research, education using of GLOBE data, and international collaboration.

The subsequent competition of student environmental projects was organised together with the Ministry of Education. Since meaningful interpretation of numerical and graphical information from Internet may be complicated for students of age 12-14, preparatory training for students was organised in January 2002, before they started their research projects. Training sessions for using GLOBE data, graphs and maps were prepared and held by Ms. Signe Sulbi, a GLOBE teacher from Lagedi Basic School.

Over thirty of the best projects were presented in the Students Environmental Conference that was organised in May 2002 by a GLOBE teacher Ms. Hilje Nurmsalu. The Conference was held in C. R. Jakobsoni Gymnasium of Viljandi, which is one of the best GLOBE schools in Estonia. A majority of the presented research projects dealt with interpretation of GLOBE data. It is remarkable, that in the Conference two schools (Rõngu Secondary School and C.R. Jakobsoni Gymnasium) presented CD-s recording the 5-year history of the GLOBE program in their schools.

Traditional annual training workshop for teachers was organised in November 2001. The agenda included training of new protocols, computer lab training for using GPS data together with a digital map, discussions on implementation and future of the program.

Teachers from Estonia started trans-national collaboration with GLOBE teachers and Country Coordinators from Czech Republic, Netherlands, Norway, Poland and UK for educational using of GLOBE environmental data. They will develop and test the curricula-adapted materials for using graphs/maps/data from the GLOBE Web site for learning different subjects. The e-LSEE project (Collaboration of GLOBE teachers for promotion of e-Learning in Science and

Environmental Education) is granted by the European Union Socrates Program, and coordinated by the University of Tartu, Estonia.

The project has Web site <http://ael.physic.ut.ee/elsee/> and open Forum <http://www.globe-europe.org/forum/> for online discussions. The first workshop of the e-LSEE project was held on 3 - 6 April 2002 in Prague. It was hosted by Czech Environmental Association, TEREZA. The workshop brought together 38 teachers and Country Coordinators from 6 European countries, as well as experts from the GLOBE headquarters.

Estonian GLOBE schools are tightly involved in the regional collaboration of GLOBE schools. Several schools collaborate with twin schools in Norway, Latvia and Finland. Many schools participate in a regional phenology project under guidance of Norwegian scientists.

The regional collaboration was highly promoted during the GLOBE Learning Expedition of Nordic and Baltic Countries, held in August 2001 in Kääriku, Estonia <http://ael.physic.ut.ee/kaariku/>. The event, organised by GLOBE-Estonia and supported by the US Embassies in Copenhagen and Tallinn, brought together over 230 GLOBE students, teachers and scientists from Estonia, Latvia, Lithuania, Poland, Norway, Sweden, Finland, Iceland and USA. Key role in local organising played the Student Organising Committee including GLOBE “veteran” students from 6 Estonian schools.

Ten international expedition groups investigated the natural environment of Kääriku, using the GLOBE protocols and instrumentation. The gathered data were promptly entered to the GLOBE data server (see “Estonian Learning Expedition, Kääriku, EE” in the list of Estonian schools in GLOBE Web site). Groups also competed in GLOBE Games and had fascinating social parties.

Several new collaboration agreements have been concluded between schools as a result of this meeting. After Kääriku, some “veteran” students organised similar expeditions in their schools for non-GLOBE students. Leader of Kääriku organisers, Martin Pentson from Suure-Jaani Gymnasium, decided to organise a MUCaTHON, and sent call for participation to all voluntary students of age 16 - 18. The Suure-Jaani MUCaTHON will be held on 17 -18 July 2002.

This GLOBE year was full of activities and events in school, country and international scales. The first generation of Estonian GLOBE students has been grown up. They offered their knowledge, skills and enthusiasm for organising of splendid events that promoted student research, environmental awareness and international collaboration.

In the next school year most schools will start with new GLOBE students of age 11 – 12. Due to the strongly reduced budget the implementation of the program will be more focused on the school scale activities.

Country Report

Germany

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Introduction

Germany joined the GLOBE Program in 1995. Contract partner for GLOBE in Germany is the German Aerospace Center in Cologne as you may say the “German NASA”. During the past years three different Country Coordinators were in charge of GLOBE, which resulted in different ways of implementing GLOBE. Therefore, GLOBE-Germany has an interesting history and experience in the implementation of GLOBE. This report gives a short overview about our current status and also characterizes our main objectives concerning the future of GLOBE in Germany.

Summary

In 2002 we have started a major campaign in recruiting new GLOBE schools/teachers. Therefore we have organized so far 7 teacher training workshops with at least 4 more to come until the end of the year. One of the most challenging objectives for our work with GLOBE is 1. to get “new GLOBE teachers” started as soon as possible after the teacher training; and 2. to give “experienced GLOBE teachers” new aspects for their work.

School Participation

Since the beginning we have recruited more than 300 schools with over 450 participating teachers including the results of our latest GLOBE recruiting campaign. Many of them are very active, some of them have never reported data even after our offer for special support and assistance. The reasons for this inactivity might be very multifarious.

Teacher Training Workshops

As already mentioned above we have started a major GLOBE campaign in Germany in order to get new GLOBE schools into the program: so far a total of approximately 140 new teachers. Based on the second objective in the summary we are currently trying to offer “experienced GLOBE teachers and students” new projects for their work. This is a big issue to keep up the motivation in working with GLOBE over a long period of time. Part of this strategy includes offering advanced workshops for more “sophisticated” protocols. More sophisticated in this context means protocols others than weather/climate or hydrology. The purpose for these advanced workshops are 1. to give more background information on this particular theme; 2. to get teachers in touch with scientists; 3. to create local networks among schools; and 4. to offer special projects based on GLOBE protocols.

Special Projects

Currently we are working on three different projects for GLOBE schools:

1. Together with GLOBE-Netherlands, -Switzerland, -Austria and other national school and institutional networks we are planning the so-called "Rhine-River-Project". This project is based on the idea to investigate the Rhine-river scientifically, culturally, historically and economically. In the summer of 2003 all participating schools are invited for a scheduled student congress in order to present all results. Hopefully this congress will be held in the house of the EU-parliament in Strassbourg.
2. As an upcoming project we are now working with the German Remote Sensing Center (branch division of the German Aerospace Center). Objective of this project will be the data validation process of the environmental satellite "ENVISAT" which was launched earlier this year. New investigation and research aspects will include the following parameters: photosynthetic active radiation, chlorophyll content, global ozone, aerosols and water vapor.
3. Furthermore, GLOBE HQ and GLOBE-Germany are developing a phenological GLOBE garden, which consists of 8 different species. This special measurement offers the opportunity for a constant observation of plants throughout the whole year due to different flowering seasons of these plants. In general, the GLOBE garden will be an excellent point of intersection for all other GLOBE protocols.

Problems / Challenges

There are a few aspects GLOBE has to reconsider: 1. How should an inactive GLOBE school be treated? Based on our experiences there should be some criteria for GLOBE schools in order to remain a GLOBE school. GLOBE policy should be to have active schools (a "high quality policy") rather than just a high number of schools, which are not active (a "high quantity policy"); 2. Another evidential problem in Germany is the fact that schools do not have enough money for measurement devices. So, in order to make sure that they have at least a little bit we are thinking about a registry fee for the participation in a teacher training. This money could then easily be used to buy desperately needed equipment, which could be handed to the teachers right away at the workshop.

Objectives

Some of our main goals for the future are: 1. to get more schools involved into GLOBE, 2. to set a minimum standard for GLOBE schools to stay on as GLOBE school, 3. to promote new and special projects and measurements, and 4. to work on a long-term funding for GLOBE in Germany.

Country Report

Ghana

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The GLOBE Programme, an international environmental science research and education partnership programme, being implemented by the Ghana Education Service has moved into a new gear of growth. Benefits of the programme have begun showing in the attitude of quest for knowledge among GLOBE students in thirty-six Senior Secondary Schools in all the ten regions of Ghana. The key impetus for this development and momentum rests on four vital pillars. These are:

1. The GLOBE Teacher Training Workshop held in July 2001
2. The GLOBE Equipment and chemicals/kits provided by the United States Agency for International Development (USAID), one of our development partners
3. Additional staff support for GLOBE Programme sub-unit of the Science Education Unit of the Ghana Education Service
4. Professional and technical oversight/support/monitoring and mentoring arrangements from the Ghana GLOBE Team.

It is of interest to state with thanks and a sense of pride that the International GLOBE Office in Washington acknowledged momentum in the development of Ghana's Implementation of the GLOBE Programme. This was done by featuring Ghana on the main HOME PAGE of the GLOBE Website for nearly two months – January- February 2002.

ACHIEVEMENTS

SCHOOLS BEGINNING TO ACKNOWLEDGE THE SCIENTIFIC AND EDUCATIONAL BENEFITS OF THE GLOBE PROGRAMME

Specifically, active GLOBE schools are gradually appreciating the fact that the programme is forming a foundation to the students' contribution to Science

- *students getting information to use in their studies and learning becoming more real as they appreciate learning as an individual process of constructing meaning from information and experience. A student at Kintampo Secondary School stated that "GLOBE makes learning real and easy; we can also find out things for others to learn"*
- *critical input is provided for the research of many scientists.*

CITATIONS RECEIVED BY MANY GHANA GLOBE SCHOOLS ON THE GLOBE CHIEF SCIENTIST'S HONOUR ROLL

About twenty-two schools have been placed on the GLOBE International Honour Roll and received special citations of good performance from the GLOBE Chief Scientist in contributing to the understanding of the environment.

SIGNIFICANT PARTNERSHIP WITH TEACHER UNIVERSITIES

Two special seminars were organised by the Country Co-ordinator for staff and students of the Science Education Departments of two of our Teacher Universities, as a social marketing endeavour. The Universities are University of Cape Coast and University College of Education of Winneba. Following the seminars a high level interest in GLOBE has been generated by both staff and students both for its pedagogic and research-resourcing benefits.

PROMOTION OF GHANA'S COUNTRY COORDINATOR

Following the recognition of the track record of performance in GLOBE Teacher Training activities, commitment to and understanding of the vision/mission of GLOBE as well as experience in other teacher training programmes, Rev E. K. Dadebo was appointed in January 2002 by the International GLOBE Office as a MASTER GLOBE TRAINER for LAND COVER/BIOLOGY MEASUREMENT PROTOCOLS. Rev Dadebo and indeed Ghana is most grateful.

GHANA TAKES PART IN A SPECIAL GLOBE WORKSHOP AND MEETING IN WASHINGTON

Mr. Kwasi Owusu-Afriyie – a member of the Ghana National GLOBE Training Team was privileged to attend a GLOBE meeting and workshop in Washington from 13th-22nd March, 2002 as an Assistant Trainer. The International GLOBE Office sponsored the trip.

HIGH MONITORING RATE LEADS TO INCREASED DATA COLLECTION AND SUBMISSION

The success story of the increased rate of GLOBE DATA reporting is worth noting. Total data points from our GLOBE Schools has shot up from about 7,000 in November 2001 to over 25,700 by 14th May, 2002 representing a significant percentage increase of about 367%. The number of schools submitting data to the international data server has also shot up from 12 to 34 within the same period, an increase of nearly 285%. The period of greatest increase was March and April 2002.

After the supply of GLOBE equipment between mid-November to mid-December 2001, it took most schools a few months to set up their equipment before starting with some of the measurement protocols. The joint GES/USAID Monitoring and Cluster Training Exercise made headmasters and GLOBE Teachers sit up and alive to their responsibilities.

GLOBE STAR IDENTIFIED AT KINTAMPO SECONDARY SCHOOL

Mr. Abdallah Saeed Khalifa – the Lead GLOBE teacher at Kintampo Secondary School has been outstanding in his work as a GLOBE Teacher and has received the nod of the National GLOBE team as a GLOBE Star. He has been recommended to join the National GLOBE training Team and to be responsible for SOIL AND HYDROLOGY INVESTIGATIONS.

Rising from a data score of about 500 points in July 2001, his school now lies in an outstretched LEAD over 6000 data points as at 6th July, 2002 more than double what the next school has. Factors responsible include Self-Motivation, Good Leadership, Support of the Headmaster, Enthusiasm and commitment of GLOBE Students, Excellent Organisational and mentorship Skills, of the Lead GLOBE Teacher and the Active support of his colleagues in the GLOBE Team. In situations where some chemicals in test kits got depleted he prepared them himself and carried on with tests. Following his school's excellent performance they are to be supplied with a special datalogger from the International GLOBE Office to help with a research to test a model that will predict soil moisture and temperature properties.

CHALLENGES

A POSITIVE CHALLENGE

The positive commitment so far demonstrated by Junior Secondary School students in the programme at Kintampo has been challenging. Following the training of three Junior Secondary School teachers from Kintampo on a pilot scheme, their schools were chosen as satellite GLOBE study sites (CLOUD Investigations) for Kintampo Secondary School.

GLOBE VEHICLE ACCIDENT

It is with regret to recall that the new FORD-EXPLORER vehicle provided by USAID was involved in a Motor traffic accident on August 25th, 2001 when three of its tyres (two rear and one front) burst in succession near Somanya leading to the loss of one life, the late wife of the Country Co-ordinator. The Vehicle is yet to be repaired. The Ghana Education Service hopes to get funds to get the vehicle repaired to facilitate the implementation of the programme.

LACK OF FUNDS TO RUN THE PROGRAMME

The successes/achievements of the GLOBE Programme so far does not seem to reflect the major constraints of funding and problems in connection with budgetary allocation. This has affected smooth administration of the programme with regards to administrative logistics for making regular supplies of the GLOBELINE Newsletter. It is hoped that as situations improve, GLOBE will take a good advantage of the improvement to enhance the work.

REPLENISHMENT OF GLOBE CONSUMABLES

A few active schools have reported the need for replenishment of some consumables for the GLOBE Research. The absence of some chemicals has led to a halt in some particular investigations. As enthusiasm for GLOBE continues to build up, the situation may turn grave if there is no provision for stock replacement.

COMMUNICATION DIFFICULTIES

Difficulties encountered in reaching some GLOBE schools either by telephone or Motorola remains a challenge. Many have missed some educative GLOBE Chats on the Internet or in receiving one piece of information or the other.

COMPUTER ILLITERACY, A DISINCENTIVE

It has been noted that schools that report GLOBE Data more regularly are those that have teachers who are computer literate. Technological illiteracy in the use of computer has so far proved to be bane on the GLOBE Programme Implementation in a number of our schools.

REPLACEMENT OF GLOBE SCHOOLS

In consultation with the respective Regional Directors of Education, *Aburi Girls' Secondary School, Eastern region, Ghanata Secondary School, Dodowa in Greater Accra Region, and Bole Secondary School, Bole in the Northern Region* have been replaced with *Mpraeso Secondary School, Osudoku Secondary/Technical School, Asutsuare, and Tuna Secondary/Technical School, Tuna*, respectively.

IMPORTANT ISSUES

SPECIAL SUPPORT FROM USAID

The support of USAID for the GLOBE Programme/Ghana in 2001 has been the main driving force in the success story in the programme implementation.

- A GLOBE Teacher Training Workshop for 108 teachers, sponsored by USAID at a cost of about 12,500 US Dollars, was organised from July 1-7, 2001.
- USAID (Gh) donated a 30,000 US Dollar-worth 4WD FORD vehicle on July 11th, 2002 for the coordinating and monitoring activities of the GLOBE Programme.
- A computer was provided by USAID to facilitate the work of the Country Coordinator. The cost of providing Internet connection was also borne by USAID.
- The fourth major support from USAID came in the form of equipment and chemicals worth about 107,000.00 US Dollars.
- The appointment of the GLOBE Country Manager (Mr. Edward Deignan) by USAID as a liaison and to provide support in the GLOBE implementation efforts of the Ghana Education Service. Mr. Deignan's selfless and remarkable commitment as well as his rich technical support to the implementation of GLOBE in Ghana has been most outstanding.

This co-operation so far extended to the GLOBE Programme in Ghana by USAID richly resourced our potentials in implementing the GLOBE Programme. We are indeed most grateful for the wonderful understanding and support of USAID/Ghana mission.

INTEGRATING GLOBE IN SCHOOL CURRICULUM

Arrangements are already on course in this respect. The Curriculum Research and Development Division of the Ghana Education Service is already studying the GLOBE Teachers Guide to facilitate a possible curriculum integration plan for at least pre-university schools in Ghana. This is hoped to be a great landmark in the development of not only Science Education but also Education in general. Data being collected from teachers in the field in this respect are being analysed. The Programme intends taking advantage of various teachers workshops in the course of the year 2002 –Annual General Meeting/Workshops of the:

- Ghana Association of Science Teachers (GAST),
- Agricultural Science Teachers Association of Ghana (ASTAG)
- Mathematical Association of Ghana (MAG)
- Conference of Heads of Assisted Secondary Schools (CHASS).
- Seminars at GLOBE Partnership Universities in Ghana

Input from these fora would provide a basis for developing a Proposal for Curriculum Integration Plan.

THE WAY FORWARD

SOURCING FOR FUNDS IN SUPPORT OF THE PROGRAMME

A new Project-funding proposal is almost ready to be sent out to Development Partners for consideration and possible support. This has become necessary in view of the need to diversify our funding sources - particularly from potential end-users of GLOBE Data.

CAPACITY BUILDING FOR GREATER EFFECTIVENESS

In our GLOBE Teacher Training workshop scheduled for 7th-13th July 2002, it is intended to give quality time to build capacity of teachers in GLOBE Data reporting through acquisition of basic computer literacy skills and effective use of the Internet.

EXPANSION OF GLOBE TO JUNIOR SECONDARY SCHOOLS

Following the success of the pilot work at Kintampo involving *Dr. Saunders Memorial Junior Secondary School, Kintampo Methodist Junior Secondary School, and Kintampo Presbyterian Junior Secondary School* as satellites to *Kintampo Senior Secondary School*, we hope to add at least twenty four satellite Junior Secondary Schools to the GLOBE Programme by the close of 2002. This is to enhance the building of our Atmosphere database. The selected schools would work only on CLOUD Investigations. This measurement Protocol requires only the GLOBE Cloud Chart. Implementation cost is relatively low as against the high benefits of data-worth.

INCENTIVES FOR HARDWORKING GLOBE TEACHERS

Hardworking GLOBE Teachers as usual need to be motivated. Such motivation provides an incentive that challenges other teachers to show greater commitment to the Programme. The Ghana Education Service is planning to reward GLOBE Teachers especially as a means of motivation. The Ministry of Education is planning to supply some computers to each of the GLOBE Schools by the close of the year 2002.

MONITORING OF GLOBE IMPLEMENTATION

Monitoring exercises conducted so far have proved very useful in enhancing the growth of the programme in the schools. All thirty-seven GLOBE Schools were visited between January and June 2002. Meetings and interviews with headmasters, students and GLOBE teachers were conducted as well as refresher courses in certain protocols, GLOBE Club Organisation and implementation techniques. It was determined that individual school visits were more beneficial due to the immediate impact in performance. This exercise will be continued from September 2002 as outlined in the 2002 Action Plan for the GLOBE Programme in Ghana.

OTHER MAJOR ACTIVITIES TO BE CARRIED OUT

September 2002:

- One Day Seminar to draft a Curriculum Integration Plan
- TV/Radio Programme on “Ghana/US Partnership through GLOBE for National Development”

October 2002:

- GLOBE Fair and GLOBE Star Awards
- Meeting of the National GLOBE Implementation Committee

November 2002:

- Rendevous with the Media

CONCLUSION

We are certainly in motion with the GLOBE Programme. Greater strides are expected and, as usual, Ghana shall surely make our mark in the Global village in this global effort to serve the interest of both humankind and the environment.

Country Report

Hungary

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Ever since Hungary joined GLOBE 3 years ago there have been 25 high schools affiliated with the GLOBE program. The aim of the program is that all students pay attention to the environment with it changes and seek to find solutions to its problems. Also, the purpose is that they share their experiences with their fellow students, family and neighbors. In order to enhance the popularity and acceptance of the program they are expected to inform the local media of their activities.

Teacher Trainings

Every year we hold teachers' training workshops for our 25 participating teachers. So far 3 such workshops have been held with a 3-day program each time. Since it takes us a while to procure our measuring supplies it likewise takes us the same length of time to train our teachers. There is a team of experts working for universities that helps with teachers' training.

GLOBE Teams

We summarize measurements once a month and send our reports to the schools, experts and the Ministries supporting the program. We also enclose the reports of the previous months to show the difference between the various performances. This gives an impetus to the students. Our affairs and competitions held to keep alive our teams' interest and zeal have been successful.

Worldwide Water Day

On March 22 2002, the GLOBE program introduced itself at an international conference that was held in Budapest. After the presentation on the GLOBE program's domestic and international activities 3 of our GLOBE schools presented their work. After that, the 10 best GLOBE schools in Hungary, represented by their teachers and students, received awards from Hungary's Ministry of Environment. There was media coverage of the event.

Synchronicity Day on Earth Day

April 22 was especially important for our GLOBE students. Simultaneously with the events of Earth Day our students performed coordinated measurements in the fields of meteorology, botany and hydrochemistry. It meant that all our 25 participating GLOBE schools conducted the same measurements at the same time, so the readings were comparable. The phenomena to be measured were compiled by GLOBE's Hungarian experts who summarized the results.

Student competitions

We advertised competitions to maintain the interest of our participating students. The themes included describing students' research, elaborating new methods, comparing old measurements with new ones, media coverage of the GLOBE program and creating a visual work of art. The evaluation of the various applications for the competition will be carried out during this fall's teachers training workshop where the winners will be invited.

School reports

We ask our schools to send us their annual reports in which they give an account of their results, problems and they give suggestions as to the future. We include these reports in our annual reports that we get to the Ministries. We also notify the media of our results.

Information

We employ a number of methods to make known the GLOBE program's domestic and international success. We take care of updating GLOBE's Internet homepage monthly. In this we are assisted by an information scientist. It is in the form of an Electronic Bulletin that we publish the latest news, our programs, the deadlines for our competitions, as well as our appeals. We send monthly reports to our two participating Ministries and the media. Besides, the country coordinator supplies the ministries with summaries both at the end of the school year and the calendar year.

GLOBE and the Arts

We started the art protocol in our participated GLOBE schools. This is the first step in a project with various stages. We announced a competition in visual culture to create works of art associated with GLOBE's themes. So far a large number of applications have been submitted to us. The evaluation is to be expected to be made this October. Next time we are going to announce a competition in both literature and music.

Country Report

Iceland

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Introduction

Iceland signed an agreement for participation in The GLOBE Program in May 1997. The Ministry of Education authorizes the coordination and financing of the program in Iceland. We have also been financially and morally supported by Developmental Educational Funds, Ministry of Environment, Ministry of Foreign Affairs, Biology Teacher's Association, the US Embassy in Iceland, Local Agenda 21's committees and some private organizations.

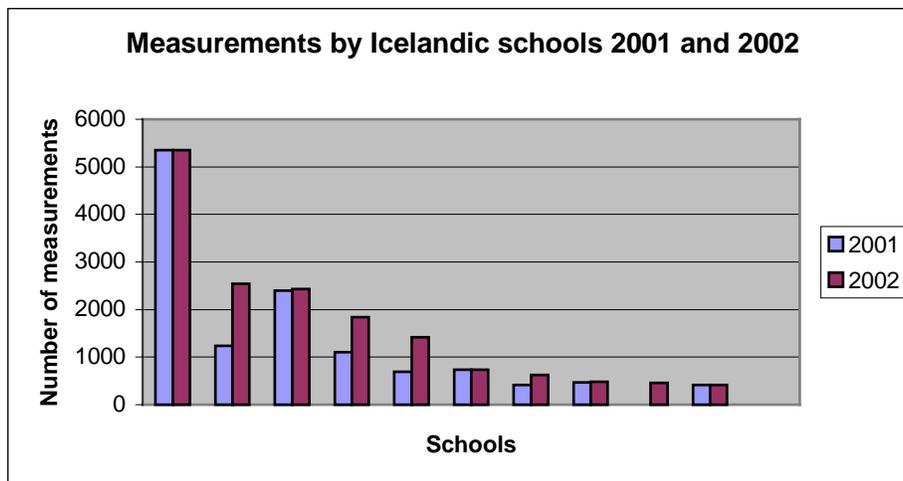
GLOBE schools

Two pioneer schools started in 1997 and slowly the number increased so now there are 11 schools implementing, eight primary/secondary schools and three high schools. This is 5 % of all primary, secondary and high schools in Iceland.

The first GLOBE Teachers Training Workshop was held in Reykjavik in June 1999. Seventeen teachers from 9 schools attended and they are all now GLOBE schools. It seems to be difficult to get enough teachers together for a workshop so we have to try to send more teachers to international workshops in our neighboring countries.

We decided to try to improve the work of the schools already implementing. I have talked to the teachers by phone and e-mail, visited the schools, assisted in buying equipments etc. All our efforts have been done to encourage them to start or to continue the work and send in measurements. The success was 27 % increase of measurements by Icelandic schools of delivering data into the GLOBE database between the years 2001 and 2002. Only one school hasn't responded and never sent in data, but several have not be very enthusiastic and not added much.

Ten schools out of our eleven schools have sent data into the GLOBE database. Most of the measurements are in Atmosphere but the schools have tried every protocol except the new ones such as ozone etc.



Implementing GLOBE is a team effort so we try get a group of teachers in every school to participate.

A new curriculum has been implemented in Iceland. It includes increasing the awareness of the environment by schools and we are trying to introduce GLOBE as a way to fulfill this objective. It seems to me that there is a competition between environmental projects, both national and European, trying to reach schools in that field. The GLOBE project builds on some qualification of teachers in science. Unfortunately, most of Icelandic teachers have their education in social or pedagogical subjects and the orientation in the teacher's universities are in the same directions. So the majority of new teachers in the schools have poor background in science. Their only science knowledge comes from high schools or even secondary schools. The scientific oriented student in college goes to university preparing for work in medicine, chemistry etc. It makes more difficult to introduce a scientific project like GLOBE to schools because the teachers are afraid to show their lack of understanding of science

GLOBE partnership with Icelandic scientists

In my last annual report I described the connections between Globe and the Teacher's universities, research institutions, local communities and the U.S. Embassy in Reykjavik. We, in connection with U.S. Embassy in Reykjavik, supported Scientific Institutions in Iceland to make a proposition for new GLOBE protocols. The Marine Institute of Iceland wrote a protocol for Reproductive phenology of five fucoids species (Phaeophyceae; Fucales) in the intertidal zone and the Natural Institution of Iceland wrote Bird Migration Protocol. Both of them are supposed to be included in the Phenology protocols of GLOBE. They will be introduced at the GLOBE-ARCTIC Workshop in Akureyri in August 2002.

Collaboration between GLOBE schools in different countries

Our main object this year has been to increase collaboration between GLOBE schools in different countries.

a. GLOBE-ARCTIC project (Arctic - POPs)

Iceland joined GLOBE schools around the Arctic in a project established by the Norwegians - GLOBE-POPs. It is aimed to measure the amount of POPs (toxic chemicals) in the Arctic

environment. These chemicals are of wide difference, PCB is the most known but we are trying to find bromine included substances (They are used to decrease the danger of fire in plastic instruments like televisions sets and computers). The dispersion of those substances are mostly unknown, but we know that the Arctic acts as a sink to substances like that. (Why we don't know). By this investigation we get samples all taken from similar subjects (animals or soil) at the same time so comparison is easier than if you are investigating on each area on a different time.

Four Icelandic teachers went to the first GLOBE - Arctic workshop in Fairbanks Alaska in August 2001. We in Iceland invited the participants to the second GLOBE-Arctic workshop in August 2002 at Akureyri, Iceland. Now late in May 2002 almost 60 persons have applied for the workshop so we expect it to be a major meeting in the GLOBE history.

b. Emphedocles

Four European schools have started collaboration on GLOBE measurements. Two of the schools are from the continent of Europe (Poland and Germany) and two are from islands in the Atlantic Ocean (Tenerife (Canary Island) and Iceland). In September 2001 and April 2002 teachers and students from Germany, Poland and Tenerife visited Iceland and in February 2002 teachers and students from Iceland went to Tenerife and met teachers and students from the other collaborating countries. We got financial support from the European Union (Comenius program) for the collaboration. The collaboration is comparing weather and water from our schools' GLOBE measurements. It will be interesting to compare the water on these two volcanic islands and on the continent of Europe.

c. GLOBE Games in Estonia in August 2001.

Three GLOBE teachers and 9 students from two Icelandic GLOBE schools went to Kääriku, Estonia for three days of GLOBE GAMES with teachers and students from Scandinavia and the Baltic states. GLOBE in Iceland was able to support this financially but the students and the schools also collected money for their journey. In September 2002 there two teachers and four students will go to Norway for the GLOBE GAMES there.

The future.

Our plans are similar to last year

1. Increase number of GLOBE schools in Iceland
2. Keep GLOBE schools active in collecting and reporting data
3. Participation in the GLOBE GAMES in Croatia, summer 2003.
4. Continuing and developing further our partnerships both to scientists and others.

Country Report

Israel

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INTRODUCTION

Israel was one of the first countries to participate in Project GLOBE on a statewide basis. More than fifty schools all over the country, from elementary level to senior high collected data and endless figures on such subjects as Climate, Atmosphere and Hydrology and sent them on to the GLOBE Center in America. Israel views this project as extremely important in sharing in this educational effort to care for the environment through an understanding of the causes and processes that affect and influence the quality of life and our surroundings.

During the course of the years, over 80 schools participated in GLOBE, some more seriously than others; some using the skills and information just for local studies, others taking it many steps further and sharing their information world-wide.

SCHOOL PARTICIPATION

The schools that were involved in collecting data did so mainly in the subjects of Climate, Atmosphere and Hydrology. Due to the geographic contrasts and the various locations of the schools in Israel, ranging from snow-covered peaks in the north to dry arid desert in the south and humid flatlands along the Mediterranean coast, the students were able to collect many interesting figures relating to changes in Temperature, Humidity and Weather for such a small country.

Hydrological testing was done mainly in fresh-water lakes and ponds in Israel. Some of the results showed a considerable regression in the water quality and this information was then publicized in the local newspapers.

Other important subjects that some schools were collecting data for locally were vehicular pollution, weather changes and biodiversity of plants and species.

One of the most important aspects of the project this year was to incorporate community and parent participation in local environmental projects that the schools were working on.

TEACHER TRAINING WORKSHOPS

Twenty –eight hour course training workshops were given to teachers all over the country whose schools were involved in GLOBE. The sessions included training in how to gather information and collect data on Climate, Atmosphere and Water Quality and how to transfer it to the GLOBE

site. Many of the teachers also benefited from the exchange of ideas and information amongst themselves throughout the courses.

SPECIAL EVENTS

Three major events took place this year in connection to Project GLOBE. The first one was the initial commencement of the project in October 2001 where all the schools that wanted to participate in the project were invited. The second event took place on Earth Day in May 2002 where students involved in Project GLOBE presented their research and information to each other around the country. The last special event was the end of the year project in which over 1200 students met at Ramat Gan Safari to take part in environmental games, activities and competitions. Prizes were awarded to the outstanding schools in the framework of Project GLOBE.

PROBLEMS

Throughout the course of the year, there were some problems that arose either because of logistics, lack of training, or lack of interest on the side of the students involved. Some schools had to deal with stolen computers, others had difficulties relying on students to relay the data to the computer on a daily basis, and there were some schools that didn't even pass on their information to other schools.

For the coming year, we hope to offer more teacher training sessions and involve more schools in the project. We would also like to discover ways in which we could make better use of the data collected, compare research and draw conclusions from the information gathered.

OBJECTIVES

Israel suffers greatly from rapidly decreasing green open spaces, soil erosion and poor quality ground soil. Next year's efforts will be put on encouraging schools to collect data on Land Cover and Soil, two subjects that we have not collected data for as of yet. Hopefully we will be able to use this information to raise the students' and communities' awareness to the problems.

We would like to have summer teacher training sessions to help the teachers cope with the problems that may arise and guide and enlighten the new ones to the Project and all its aspects. This summer, the Ministry of Education is supposed to buy new and improved equipment needed for data gathering in the schools.

Another idea raised to improve the success of the Project is to divide the subjects among the different grades so that each class is working on a separate topic. Thus, each school will be better able to cope with broader information gathering on a variety of topics of interest in the country.

Country Report

Japan

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GLOBE in Japan started in the fall of 1995. We have the seven years experience of GLOBE activities. As the Internet system was insufficient system in Japanese school education seven years ago, the support and advice regarding the Internet and data submission to GLOBE schools was one of the main tasks of the GLOBE Japan Center when GLOBE started. However, there was a rapid expansion of the Internet into the school system in the 4 years since 1995; many schoolteachers also have gained the knowledge of the Internet. We think that the foundation of GLOBE activities has been established for the past 2-3 years. In this country report, we show the summary of Japanese GLOBE activities for the past 2-3 years and the themes of future activities of GLOBE in Japan.

The Adaptation of GLOBE in New School Curriculum in Japan

There has been a problem in the adaptation of GLOBE to the Course of Study of Japan since GLOBE started, because the Course of Study has fixed the educational parameters of each subject in the school curriculum. Thus the GLOBE teachers in schools did not have many chances to implement the GLOBE Program. Although the meaning of GLOBE and its measurement was taught in science classes, GLOBE measurement activities in many schools have been implemented at the school but not during regular class hours. (That is, 'Special Education Activities' such as student club and student council regarded as school time.) Recently, there have been new chances to implement GLOBE in schools. The Ministry of Education, Science, Sport, Culture and Technology (MEXT) proposed a new period in the school curriculum in 1998. The name is the Period for Integrated Study.

One of the aims in the Japanese GLOBE activities for the last 2 years has been to examine a smooth integration with the Period for Integrated Study that started from this April as a new Course of Study in Japan. The educational objectives and targets in this new school period already were written in a former Abstract in the Sixth Annual GLOBE Conference. MEXT permitted the school to try the educational activities as a part of the Period for Integrated Study from the year 2000, although the new Course of Study hadn't formally started. Some GLOBE schools tried to conduct as of the educational activities of GLOBE as part of the school period of Integrated Study and obtained positive results in the inquired leaning method. Although the Course of Study doesn't show the detailed themes on educational quality in the Period for Integrated Study, the themes of international understanding, information education,

environmental education, and welfare education are suggested as examples. Therefore, although some GLOBE schools have adopted the GLOBE Program as a theme of the period for Integrated Study, entire activities in this period are not devoted to GLOBE Program or environmental learning. The GLOBE Program is one of the themes that are established in each school. The Period for Integrated Study covers various educational themes as environment, welfare, information and international understanding and is comprehensive to let students have the ability of problem solution, featuring in study on the basis language; math; social study; and science. I think there should be smooth integration between GLOBE and other educational fields when the GLOBE Program is adopted into the Period for Integrated Study.

Although the Period for Integrated Study features the various educational themes, I think that GLOBE itself can provide the important themes. It is important that the GLOBE Program is based on the inquired learning method. The period for Integrated Study also has the objective that students observe their surround environments, discover some main topic, make hypotheses and survey to solve the problem. It is inquired learning or problem based learning. The initial work and plan of this school period should be decided by each school, because the topics tried by students varies among schools. GLOBE has recently developed the good effective learning activities using GLOBE Program. These learning activities can provide a chance for the introduction of scientific feature into the Period for Integrated Study.

We have some experiences in inquired process while administrating the GLOBE Program in Japan. In this report, one of them is introduced. The example described by interviewing to the principal of a secondary school in Kyoto is a typical inquired learning activity. GLOBE students of this school measured the water temperature, transparency, pH and electric conductivity in GLOBE hydrology site of a river near the school. They also temporarily expanded the measuring site to upstream and downstream of the GLOBE site during summer vacation. They conducted the same measurements of the GLOBE site upstream and downstream, and discovered a difference of electric conductivity among various measurement points. The values of certain points showed the slightly higher in electric conductivity than other points including GLOBE site. They repeated the measurements and confirmed the difference of values. They couldn't find a reason for the difference in EC values. When a GLOBE student of this school cross the bridge on the river where there are some measurement points, he discovered the fact that water at the point with slightly high value is clean though water at another point is soiled because of reconstruction of a bridge upstream. He considered this carefully and discussed it with students and his teacher. They speculated that the ground water goes into the river. If the students didn't have the experience of conducting a water survey, he would go across the bridge without any such discovery. This shows that GLOBE activities enhance student ability to conduct research.

The Issues in the Dissemination of the GLOBE Program in Japan

Dissemination of meaning of measurements

Since 2 or 3years ago, many analytical examples of environmental science using GLOBE data have been reported by scientists. These reports have great effects for GLOBE students in gaining an understanding of how the results they produced can be used in analysis of environmental science. The GLOBE Japan Center has the role to disseminate results analyzed by using GLOBE data into Japanese GLOBE schools. We should also try to use the GLOBE data for analysis of the condition of natural environments in Japan and East Asia.

Development of Such Learning Activities on GLOBE as EILNet

To raise students' motivation to learn about GLOBE, the learning activities are essential. We feel that the extension of learning activities developed by the US GLOBE center is very important. Therefore, we translated the learning activities on atmosphere and hydrology into a Japanese version that was issued this January. We will issue the second version on soil, land cover and phenology. Moreover, we will try to develop new educational materials and learning activities that enable GLOBE students to understand each aspect of GLOBE protocol and the analytical process of GLOBE data. Since we have experience in creating learning activities that have been introduced in the EILNet program (please refer it in Proceedings of the Sixth Annual GLOBE Conference), we will try to develop new learning activities based on the EILNet.

Dissemination of Information on Educational Activities in Each GLOBE School and Supporting of Exchange Among GLOBE Teachers

It is very important that GLOBE teachers are aware of the educational activities of the other GLOBE schools, as the examples in the other schools suggest the educational plan using GLOBE Program. We also need to support the exchange of educational experience among the teachers for dissemination of information on educational methods. We already have offered a mailing list for GLOBE teachers, but its use is not widespread. We will encourage teachers to use this mailing list for the exchange of educational activities.

GLOBE Student Conference for Exchange

The exchange of ideas among GLOBE students has great influence on motivation for study. We encourage each school to make a Home Page about GLOBE activities in schools for information extension of students' activities on GLOBE. It had good results for exchange of ideas, however it is necessary to support the exchange of activities with actual interaction. We offered this chance at a conference for GLOBE students this January and saw good results regarding the exchange of students and motivation for learning. (The results of this conference are presented in a poster session of the 7th Annual GLOBE Conference.) The next student conference will be held this fall by the GLOBE Japan Center, with financial support from MEXT.

Support to Japanese GLOBE Schools for International Exchange

The GLOBE Program has a feature of international understanding as well as understanding earth systems. Japanese GLOBE students will be encouraged by knowing students who measure environments, analyze GLOBE data and propose the improvement. At the same time, Japanese students who have continued with GLOBE Program activities will provide foreign students with encouragements. The international and mutual relations for good direction is necessary for the GLOBE Program. We will try to give Japanese GLOBE students information about foreign students attempting measurements and analysis of the earth and to offer Japanese GLOBE students and teachers a chance to participate in a conference in Croatia.

Financial Reinforcement in GLOBE Japan Center

For the implementation of the above by GLOBE Japan Center, there is financial support. We are trying to get new financial support from companies, but it has not been successful. We will continue to gain financial support.

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Country Report

Nepal

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Nepal joined the GLOBE Program as the 92nd country on March 3, 2000. Nepalese Secretary of Education Mr. Jaya Ram Giri and U.S. Ambassador Mr. Ralph Frank signed an agreement to initiate the GLOBE program in Nepal. The Environmental Camps for Conservation Awareness (ECCA) was given the responsibility of Country Coordinator. And ECCA gave the Country Coordinator responsibility to me. Since then, ECCA has hosted a GLOBE International Training Workshop for the Asia-Pacific region (October 18-25, 2000) in Nepal, conducted several regional workshops within the country, linked the GLOBE Program with school curriculum, translated worksheets into Nepali, monitored data entry on the GLOBE website by some of the schools, and is continuously coordinating various GLOBE related activities in the country. Due to financial constraints, the activities are only implemented in a limited way. To date, USAEP has helped to prepare for the International Teacher Training Workshop for the Asia-Pacific region and has helped to conduct the regional workshop, as well as to distribute computers. GLOBE Washington is providing technical support.

The activities that have been implemented in Nepal from the starting are:

Asia Pacific International Teacher Training Workshop

The GLOBE program was launched in Nepal with the start of the International Workshop to train teachers and NGO members. The International GLOBE Training Workshop was held at Budhanilkantha Higher Secondary School, Narayansthan, Kathmandu from October 18 to 25, 2000. There were 75 participants in the workshop of which 37 were from Nepal and the rest from all around the world. The workshop delegates were from 8 countries of the Asia & Pacific region: Sri Lanka, New Zealand, Thailand, South Korea, Bangladesh, India, Pakistan and Nepal. The trainers and scientists came from different parts of the world including the U.S. Space Agency - NASA- and trained the participants on measurements and various protocols. The International participants were responsible for all costs -- such as transportation, meals, and accommodation -- during the workshop. This training workshop was the first step in the train-the-trainer process to be implemented in Nepal.

Teachers Training

After the International Training Workshop for the Asia-Pacific region, three in-country regional workshops were conducted in the eastern, central and western parts of Nepal. In these three regional workshops, 52 participants (42 teachers from 25 different schools and the rest from organization) were trained from different parts of Nepal.

One GLOBE training workshop was conducted on request from the King Mahendra Trust for Nature Conservation (KMTNC) / Annapurna Conservation Area Project (ACAP) to the schools of ACAP region. There were altogether 15 participants from 5 different schools and organizations. Principals, science teachers, ACAP field staff and District Educational Officer participated in the program held in Pokhara from June 7 - 10, 2002

Meeting with GLOBE Participants

Several meetings were held at the ECCA Office, Kathmandu, to discuss the challenges faced in implementing GLOBE program in schools. These meetings helped to identify problems and find solutions to them.

GLOBE Program Interactive Review Workshop

One Interactive Review workshop was held at American Center in the presence of two trainers (Mr. Michael Hales and Ms. Pratiksha Patel) from GLOBE Washington on January 23, 2002. During their stay in Kathmandu, they also visited three GLOBE schools inside the valley. Such type of interaction and visit has encouraged the teachers and students.

Computer distribution

With the help of the American Center Public Affairs Office, ECCA distributed three computers along with a printer and provided one year of unlimited Internet service to the GLOBE schools in eastern, central and western regions of the country. From the second year on, the schools will manage the cost of Internet themselves. Any GLOBE school in the region can use this computer and Internet service. In the future, it is planned to distribute more computers to other GLOBE schools

Equipment distribution

Obtaining equipment is the main problem being faced by the schools. The schools do not have high quality equipment. So, most of the teachers are requesting equipment. Several maximum minimum thermometers along with calibration thermometer and weather station boxes were distributed to several GLOBE schools inside and outside the Kathmandu valley. It is planned to distribute more max-min. thermometers with weather station box and rain gauges to the GLOBE schools. In future, it is planned to properly equip each GLOBE school.

GLOBE schools are also taking data by sharing the equipment with the other schools and ECCA.. One of the GLOBE teacher has developed a model of maximum minimum thermometer, which clearly shows its function.

Linkage of GLOBE protocol with the Curriculum

With the help of local GLOBE trainers, a chart was developed on how the GLOBE protocols can be linked with school curriculum. This chart has become very helpful for the teachers.

Orientation for GLOBE Students

Orientation was given to the GLOBE students of Suryodaya High School (Pokhara), Bal Kumari Kanya High School (Narayangarh), Sankat Mochan Ram Rati School (Janakpur) and Budhanilkantha School. In this orientation, discussion was held on the use of GLOBE protocols, how GLOBE protocols helps them in the studies and the method of entering data in GLOBE Website.

Translation in Nepali

Most of the worksheets were translated in Nepali and first phase of Nepali translation of video cassette was completed.

Scientist's Chief Honor roll

In the determination of the GLOBE Scientist's Chief Honor Roll, Two GLOBE schools have been awarded the Scientist's Chief Honor Roll in Cloud Observation.

Data entry in GLOBE web site

Some of the GLOBE schools have already started to enter data in the GLOBE web site. More schools will be doing so in the future.

Country Report

New Zealand

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Introduction

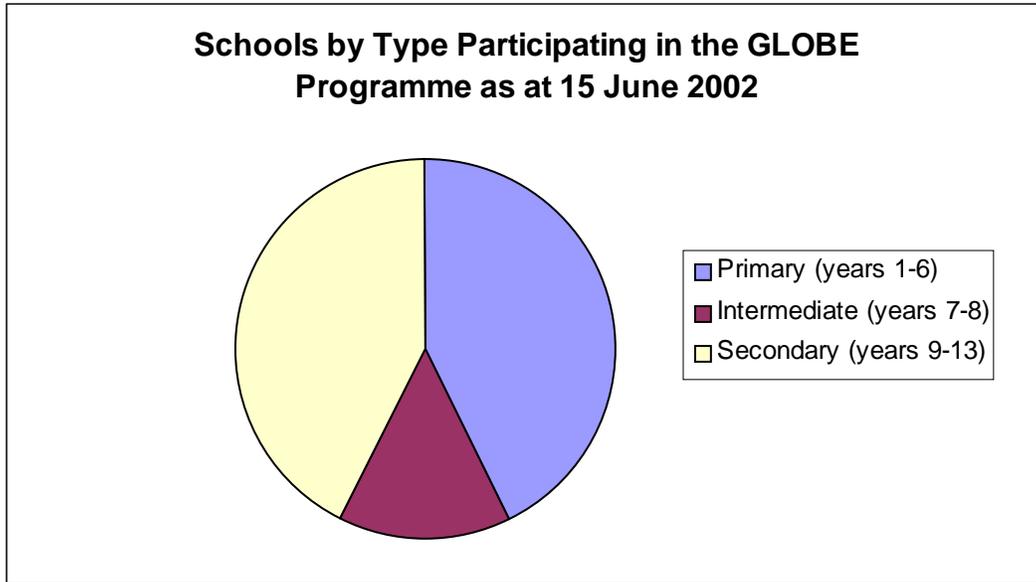
The GLOBE programme was introduced to New Zealand in late 2000, with the first schools being trained in January 2001. During the first year of the project much time and effort was invested in aligning the resources of GLOBE with the New Zealand national curriculum and establishing the programme as a high quality learning opportunity for New Zealand students. The emphasis within the second year of the project has been the training of teachers and the establishment of a community of GLOBE schools within New Zealand. The third phase of implementation of the programme is now shifting to the establishment of issues based learning communities within the GLOBE programme.

The GLOBE programme in New Zealand has been positioned within the New Zealand national curriculum as an element of the growing area of environmental education. The implementation process recommended to schools indicates how GLOBE can meet the schools requirements to meet the "Guidelines for Environmental Education in New Zealand Schools" (Ministry of Education, 1999). Central Government funding is increasing for environmental education in the present political climate and within this framework GLOBE is positioned to continue strongly over the next 3 years.

School Participation

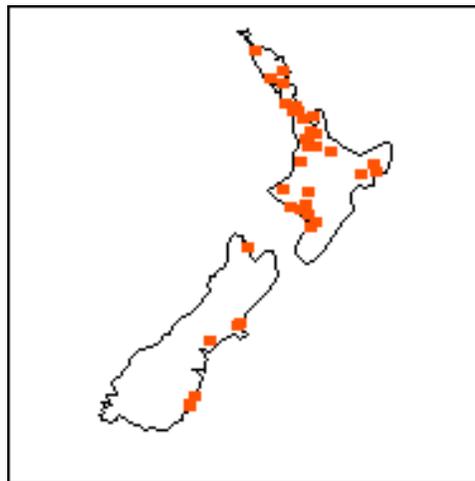
Over 70 schools have now had teachers trained as part of the GLOBE programme in New Zealand, which represents approximately 3% of the total 2708 schools in New Zealand. The depth of programme implementation displayed by participating schools ranges from non-involvement at present through to active environmental research based on perceived environmental issues.

Schools from all sectors of the compulsory education system in New Zealand are participating in the programme with an even spread between primary (elementary) schools and secondary (high) schools. Approximately 26,000 students in New Zealand have been made aware of the programme.



Of the 70 schools participating in the programme at present, 43% are primary, 9% are intermediate and 43% are secondary.

Geographical Distribution of New Zealand Schools Participating in the GLOBE Programme as at 15th June 2002



Teacher Training Workshops

Since the 2001 report, 8 teacher-training workshops have been run and 2 more are planned for the remaining months of 2002.

Region	Date	GLOBE areas of Study
Rotorua	September 24 th – 27 th 2001	Atmosphere / Hydrology / Soils / Landcover
Auckland	November 12 th 13 th 2001	Atmosphere / Hydrology
Auckland	November 26 th 27 th 2001	Soils / Landcover
Palmerston North	January 22 nd – 25 th 2002	Atmosphere / Hydrology / Soils / Landcover
Christchurch	April 9 th – 12 th 2002	Atmosphere / Hydrology / Soils / Landcover
Nelson	May 18 th – 21 st 2002	Atmosphere / Hydrology / Soils / Landcover
Masterton	June 13 th – 16 th 2002	Atmosphere / Hydrology / Soils / Landcover
Invercargill	July 2 nd – 5 th 2002	Atmosphere / Hydrology / Soils / Landcover
Hamilton	September 24 th – 27 th 2002	Atmosphere / Hydrology / Soils / Landcover
Whangarei	October 31 st – November 3 rd 2002	Atmosphere / Hydrology / Soils / Landcover

All teacher-training workshops also contain sessions on environmental issues, programme implementation, links with local, regional and national environmental agencies and a general background on the GLOBE programme and the resources offered by the website.

Special Events

GLOBE schools in New Zealand are being encouraged to participate in collaborative research projects as part of the GLOBE programme. These programmes include;

- The Cloud Sat project, in conjunction with Colorado State University. A project that is seen as accessible and achievable for all schools and at all levels.
- Mainland Island Rehabilitation Project, in conjunction with the University of New Hampshire and Landcare Research, a New Zealand Crown Research Institute. This project aims to link GLOBE students into a current research project looking at monitoring the rehabilitation of mainland ecological islands. Students will ground truth biodiversity changes over time in areas of native forest that are being managed as

mainland islands to exclude exotic pests. This work follows on from successful work done by the New Zealand Department of Conservation in establishing exotic pest free reserves on several offshore islands around New Zealand. The work by students will be correlated with satellite imagery being studied by the University of New Hampshire.

- The Waikouaiti Estuary Management Project. This project links Karitane and Waikouaiti schools with the Otago Regional Council and a local community action group in monitoring and developing a management plan for the local river and estuary system. The schools are involved in environmental monitoring as well as a riparian replanting scheme to improve the quality of runoff into the river.

Problems / Challenges

The integration of the GLOBE programme into the New Zealand curriculum has taken considerable time and effort but has been necessary to build a quality programme for New Zealand students. The first step in this process was the development of a curriculum links matrix with the achievement objectives from the 7 essential learning areas of the national curriculum mapped onto the learning experiences of the GLOBE programme. This forms the basis of a top down approach for teachers in planning classroom units of work. The second step in the process was the commissioning of experienced teachers to develop specific units of work reflecting a range of curriculum areas showing how activities from within the GLOBE programme meet the requirements of the New Zealand national curriculum. This is seen as a bottom up approach to implementation.

Objectives / Plans for the future of GLOBE in New Zealand

The next phase in the national implementation for the GLOBE programme in New Zealand is to establish a geographical network of mentor teachers throughout the country. The framework for this is shortly to be discussed with the Ministry of Education, the funding agency for GLOBE. The plan is to develop this group from within the existing community of GLOBE teachers by using the training available at the Asia / Pacific train-the-trainer workshop scheduled for January 2003 in New Zealand.

Country Report

Senegal

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Senegal signed the GLOBE program agreement in 1996. Two training sessions were held in March 1995 and April 1998.

UNHCR OFADEC program achievement

The GLOBE program started in the field in 1998 with the special GLOBE UNHCR OFADEC program for Refugees in Senegal. The project was to give to refugee students in Senegal the opportunity to learn on environment through a variety of activities in the field. The goal was to raise the refugee children awareness on environment, the quality and the interest in science education.

This program reaches also Senegalese students who are in the same schools with refugees. The choice of the schools was based on schools hosting refugee students. Four schools were chosen in collaboration with the GLOBE country coordinator, two schools in Dakar Lycee Limamoulaye and Lycee Blaise Diagne and two schools in the north region of Senegal Ecole Baba Dickel Wone and Ecole Ourrossogui I. These schools were equipped with computers and measurement kits, two teachers were trained by class to work on the protocols.

The program started with the Atmosphere Protocol in 1998, one year later two schools started others protocols. Lycee Limamoulaye has performed all soil protocols and hydrology and has identified a land cover site and trained students on land cover. Ecole Ourrossogui I has also performed hydrology measurement using the river Senegal as their hydrology study site. The data collected were sent to GLOBE through GLOBE server. Lycee Limamoulaye and Lycee Blaise Diagne have direct access to internet to send directly their data to Globe. The two other schools data were sent to GLOBE through OFADEC internet connection.

Lycee Limamoulaye has developed a partnership with a school of horticulture CFPH, they practice joint hydrology measurements and analyze of their data. These measurements are particularly useful for CFPH students who have hydrology in their education program. The hydrology site and the second soil site are in the CFPH school. The joint measurement in the school allows a quality control on water used for irrigation. The area plays an important role in vegetable production.

In Lycee Limamoulaye and Blaise Diagne the GLOBE Classes have had last year 82 % of success in their final exams. Many students who are now in Dakar University are good students in science and have good results in their annual exams. The schools are involved in most of the activities on environment in Senegal, they participate every year on Earth Day. Their temperature data are used by teachers in their geography class.

GLOBE in Senegal; The Challenge

In Senegal the development of the program is handicapped by the lack of resources. The national program has not been able to have minimal funds to increase the participation of schools selected for the program. There is a need to look for collaboration and to select a new country coordinator to push forward the program. One of the suggestions is to increase the participation in the two schools that host a large number of students, more than 5000 students. The limitation for Lycee Blaise Diagne is a hydrology site, the only water source available is the sea.

The two training sessions organized in Senegal show the interest of teachers to start GLOBE Program in their schools. GLOBE headquarter have to support the country coordinator in funds research for the program in Senegal. Lycee Blaise Diagne was among the 53 GLOBE schools that received an award for the quality of the data then send to GLOBE.

Perspectives

On June 21, 2002 a party was hosted by the school for the distinction received. Among participants were the US embassy, the Cabinet Director of the environment ministry, UNHCR /OFADEC representative students and teachers. Medias were also part of the event, the national television has covered the event in his main journal that reach countries like Guinea Bissau, Mauritania, Gambia. Newspapers have also dedicated articles to this event. The principal took this opportunity to call for the ministry of environment to get more involved in the program and the extension of GLOBE school in the country.

Country Report

Thailand

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Background

Thailand signed the preamble agreement between the Government of the United States of America and the Government of the Kingdom of Thailand for Cooperation in the GLOBE Program on September 30, 1999.

Activities

- **Localization of training materials**

May-September 2000

Translated and edited the Implementation Guide for Teachers, Teacher's Guide of GLOBE Learning Investigations (Soil, Land cover/Biology, Hydrology, Atmosphere, Season, GPS), Toolkit, Data Entry Worksheet.

September 2000

Translated GLOBE videos.

March 2001

Developed Data Entry Guide.

March-May 2002

Updated Teacher's Guide of GLOBE Learning Investigations (Soil, Land cover/Biology, Hydrology, Atmosphere), Data Entry Worksheet, Data Entry Guide, to conform with GLOBE version 2002.

May-June 2002

Translated new version of GLOBE videos (GLOBE Overview (short version), Data, Process & Flow and Earth As A System).

- **Training of Trainers**

October 2001

12 trainers attended GLOBE International teacher training workshop in Nepal.

January 2002

8 trainers attended GLOBE International teacher training workshop in India.

- **Recruiting Schools**

December 2000

32 schools (registered priorities with respect to teachers' attitude, and readiness in terms of budget, study sites, equipment and ICT facilities).

April 2001

30 schools (registered priorities with respect to teachers' attitude, and readiness in terms of budget, study sites, equipment and ICT facilities).

June 2002

30 schools (registered priorities with respect to teachers' attitude, and readiness in terms of budget, study sites, equipment and ICT facilities).

- **Training of Teachers**

December 2000

First teacher training workshop at *Mahidolwittayanusorn School* in Nakornprathom Province-- 57 teachers from 32 schools, 2 teachers from each school, 5 days, 4 topics (Hydrology, Soil, Atmosphere and Land cover/Biology).

April 2001

Second teacher training workshop at *Prachinkullayanee School* and *Prachantarajbamrung School* in Prachinburi Province-- 55 teachers from 30 schools, 2 teachers from each school, 5 days, 4 topics (Hydrology, Soil, Atmosphere and Land cover/Biology).

June 2002

Third teacher training workshop at *Dhammasirisuksa School* in Cholburi Province-- 57 teachers from 30 schools, 3 days, 4 topics, two teachers from each school, one learned Atmosphere and Soil, the other Hydrology and Landcover/ Biology).

Three potential GLOBE partners' representatives from 3 university science faculties were invited to observe training activities.

- **Follow up and Retention Support**

June 2001, Oct 2001

Followed up GLOBE activities via telephone, follow up letters to school administrators.

Nov 2001- Feb 2002

Visited schools (2 in Bangkok and 4 in up-country)

May 2000- present

Develop and update GLOBE website (in Thai language) to provide GLOBE materials; disseminate updated information from GLOBE international; and provide forum for trained teachers to discuss the implementation problems and ask questions etc.

January 2001-present

Seek financial support from private agencies and non-profit organizations to contribute to poor schools actively engaged in GLOBE.

- **Curriculum Integration**

July 2001- present

Develop guidelines for the integration of GLOBE activities into current science curriculum standards as essential academic learning requirements at all school levels.

- **Student Research and Collaboration**

Dec 2001- present

Student-Scientist Collaboration Research; 2 schools are working with NASA soil scientists

- *Ban Yangsoon School* - 4 topics: Soil and Atmosphere using watermark sensor and data logger (4 groups of students – 4 students in each group)
- *Dara Academy School*- 2 topics: Soil and Atmosphere using watermark sensor and data logger (2 groups of students – 6 students in each group).

May 2002

Conducted a workshop for 10 outstanding GLOBE schools (who send data regularly and continuously) to discuss with each other and local GLOBE scientists, and to share ideas for encouraging student research and student-scientist collaboration research.

- **GLOBE on Distance Education**

May-June 2002

Broadcasted public tele-education video on GLOBE investigations (100 minutes) with the cooperation of the Royal Distance Education Foundation.

- **Impact of GLOBE on communities**

2001- Present

Kird Kaew Observatory regularly organizes several Science Camps related to GLOBE topics.

Thin-Tharn-Thai Institute lead by the local Earth Science scientist, with cooperation of local community authorities, provides learning activities of

”Know Our Own Land” for students, teachers and communities by adopting the GLOBE philosophy and concepts, and integrating the GIS to nature, environment, economics, social and culture studies.

- **Promotion of GLOBE**

January 2001 - Present

Publicize GLOBE activities through mass media e.g. press conference, newspaper, and Educational Television Program.

- **Special Events**

10-11 December 2001

The International Soil Symposium was held at Chiangmai University, Thailand under the support of the GLOBE Program and IPST to provide Thai teachers opportunities to work with both local and NASA scientists (Dr. Elisa Levine, and Ms Jessica Robin).

12-13 December 2001

The NASA soil scientists (Dr. Elisa Levine, and Ms Jessica Robin) visited Dara Academy school, Chiangmai Province and Ban-Yangsoong School, Kanchanaburi province to install the data logger (to automatically measure air temperature and soil temperature at different depths) and the Watermark sensor (to automatically measure soil moisture at different depths) and discussed with the student researchers how those data could be used under their supervisions.

In addition, the students and teachers had the opportunities to learn, to ask questions, to discuss and to work with NASA’s scientists at the soil pit on soil formation, soil characteristics, soil sampling techniques, principles and techniques in using data logger and watermark sensor to continuously collect data on soil temperature and soil moisture at different depths. Students were engaged to raise their interest and to help them inquire about the relationships of air temperature, soil temperature and soil moisture at different depths. Both students and teachers gained a lot of experience, enjoyment and were anxious to do the research projects. Ban Yangsoong School also came up with 4 student-scientist collaboration research projects.

14 December 2001

NASA soil scientists (Dr. Elisa Levine, and Ms Jessica Robin) gave a special lecture on “A Review of NASA’s Earth Science Research” (General purpose Simulation model of the Atmosphere-Plant Soil System) at Winsor Suites, Bangkok, Thailand. Two hundred and fifty teachers, scientists and environmental university students attended this event.

Future Plan of Activities

- Cooperate with 24 universities to set up GLOBE centers at different parts of Thailand to be able to implement GLOBE effectively and locally.
- Select potential trainers to attend the next GLOBE International Teacher Training workshop.
- Seek external support for the “Development of the Young Environmental Scientists for Global Environment Project” to encourage using GLOBE data on student research and student-scientist collaboration research.
- Create demand for GLOBE integration to school curriculum standards; exemplars curriculum materials will deploy GLOBE activities in all science subject areas.
- Collaborate with private companies to invest in GLOBE equipment and instruments and explore possible sources of alternative or locally-made instruments.
- Produce GLOBE video training series for teachers’ uses and for ETV broadcasting.

Country Report

Trinidad and Tobago

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The GLOBE Program, which started in Trinidad and Tobago in 1996, is at last beginning to show signs of expansion. Four (4) workshops to prepare teachers for the introduction of the GLOBE Program to schools were held in 2002.

Duration	Venue	Target Group
1 day	RCLRC	Secondary teachers
4 days	Tobago	Primary and Secondary teachers
2 days	Petrotrin	Primary and Secondary teachers
4 days	RCLRC/other	Iere High School/ M.T.S. staff

A competition for GLOBE schools to mark World Environment Day did not occur due to lack of financial follow through by the organizers. Petrotrin donated five (5) GLOBE kits to schools in Trinidad and Tobago and has recommitted itself to supporting the GLOBE program through sponsorship of training workshops and monitoring of the programme.

New GLOBE schools

GLOBE Kits were distributed to:

Tranquillity Government Secondary School
Mucurapo Senior Comprehensive School
Providence Girls (R.C.) School

Special Activities

During 2001 the National Coordinator introduced in-house training sessions to IERE High School. Through this training programme the Maintenance Training Services (MTS) joined the GLOBE program on a request by one of its managers. (Most schools in Trinidad and Tobago have MTS security attached to them).

Training Colleges Programme

With the expansion of the GLOBE Program to Primary schools, it was necessary to introduce the programme to the Teachers Training Colleges. The principals of these institutions were briefed about the GLOBE Program and science lecturers were encouraged to integrate some of the GLOBE Education activities into their science programme. (One science lecturer at the Training

Colleges is trained). This programme is expected to be fully implemented by the beginning of the 2002-2003 academic year in September 2002.

Performance of Schools with GLOBE kits

In 2002 four schools, three secondary and one primary and the MTS security at the Ato Boldon Stadium, started continuous monitoring of the environment. The International School of POS, an institution that follows a US Secondary schools curriculum, joined the GLOBE Program. One teacher (U.S. trained) is conducting the programme at that school. Iere High School, Couva Government Secondary and Plum Mitan Presbyterian (Primary) School have involved their communities in their Environmental Education activities and have developed innovative ways to sustain the programme. The programme is conducted by Environmental Clubs in the two secondary schools while a Community Based Organization (CBO) supports the activities at the primary School. Visits were made to several schools to encourage the introduction of the GLOBE Program.

Training of Curriculum Division Personnel

One Curriculum Officer joined the Curriculum Division in 2001. This officer, Ms. Claudette Ible, has been undergoing training and should assist the National Coordinator in managing local GLOBE activities. Two Science Curriculum Facilitators have also been undergoing training to support the initiative at the Primary Level.

Local GLOBE Newsletter

The production of a Local GLOBE Newsletter was discussed with GLOBE Schools. This programme is expected to start in 2002.

GLOBE Instrument Shelters

The Golden Grove Prison was given a contract to build 10 GLOBE instrument shelters. This project was not completed in the time frame originally planned and adversely affected the starting up of the GLOBE Program in some schools. A better arrangement for the supply of these shelters will be made in 2002.

Outreach Programme

The National Coordinator in 2001 continued to use opportunities where he was invited, to provide information about the GLOBE Program. Through this activity several groups and institutions have been enquiring about this Environmental Education (EE) Programme.

National Biodiversity Strategy Action Plan (NBSAP)

The National Coordinator was able to influence, this Government appointed committee, to accept the GLOBE Program as the vehicle for introducing EE in our schools curriculum. The NBSAP and the National Environmental Policy are two documents that guide EE in Trinidad and Tobago.

Sustainability of GLOBE Program

The initiative to involve Regional Corporations Borough Councils in the environmental activities conducted by schools in their areas was explored to provide sustainable support for the GLOBE Program. Petrotrin has agreed to provide schools with materials needed to sustain this programme. A plan of action was discussed and a blue print is to be prepared for implementation in 2002. All stakeholders will be invited to participate.

Technical Support for GLOBE Programme

The National co-coordinator drew on the expertise from the University of the West Indies (U.W.I.), E.M.A, Petrotrin, Ministries of Agriculture and the Environment, the Water and Sewerage Authority (WASA) and the Institute of Marine Affairs and Environment Tobago in the training programmes organized during the year. The Meteorological office has expressed interest in using the atmosphere observations at all GLOBE schools sites.

GLOBE Signs for Schools

This matter was discussed during the year. Petrotrin has agreed to sponsor these school signs. This will be launched in 2002. The objective is to provide identification of GLOBE schools to the national community, which hopefully will assist in the protection of GLOBE shelters and equipment.

GLOBE Program Outlook for 2002

- Community groups will be invited to exhibitions organized by GLOBE Schools at which information on the GLOBE Program will be shared. All stakeholders in the community will be invited.
- In 2002 the GLOBE programme will be strengthened in the secondary schools. GLOBE Kits will be removed from schools where there is no activity and given to interested schools.
- The GLOBE Program will be introduced to the Teachers Training Colleges by September 2002.
- Greater collaboration and community support for the GLOBE Program will be encouraged.
- All GLOBE Schools will be properly identified with GLOBE signs.
- A Local GLOBE Program Newsletter will be inaugurated. Releases on GLOBE Program update to the print/electronic media will be started.
- Teacher Training Programmes will be continued. In-house training will also be included in the Training schedule
- GLOBE Program Exhibition, in schools, will be introduced in October 2002.
- Monitoring of all GLOBE School activities will be implemented in collaboration with EMA and Petrotrin.
- Public Relation activities will be stepped up to promote environmental consciousness through the GLOBE Program.
- An Environmental Education Policy Document, in which the GLOBE Program will be used as the vehicle for implementation, will be prepared in collaboration with all stakeholders
- GLOBE Program office will be established in all educational districts.
- GLOBE Program Education Activities will be integrated into the school curriculum at both primary and secondary level.

Country Report

United Kingdom

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UK Annual Review 4; April 2001 to March 2002

The GLOBE Programme's fourth year of activities in the UK saw the piloting of new activities in Sustainable Development, new partnerships developing in Scotland and England, and our first EU-wide project working with GLOBE schools in five other European countries.

With support from BT, GLOBE-UK put the finishing touches to a range of pilot activities in sustainable development during the year, which will be developed further in 2002 and beyond. The activities have been developed by teachers for teachers, and enable class-based collection and evaluation of data, all using the Internet. These activities have been developed in partnership with GLOBE in Holland, providing comparative data for everyone to use. We aim to have simple measures of sustainability, which also support curriculum teaching. At the moment there is one activity in each area of transport, energy, waste and biodiversity – but other activities are planned over the next twelve months. Feedback from teachers – including ideas for developments - will be very welcome: just email us at admin@globe.org.uk. *Our website now features a range of materials on sustainable development for use in the classroom - and all can be downloaded for easy copying.*

Scotland On-Line

Thanks to a partnership with the Glasgow Science Centre, GLOBE is now active in Scotland with a growing cluster of schools in the Glasgow area. A special 'ClydeWatch' project has been developed, with links to the Scottish Curriculum to encourage its use in both primary and secondary schools. As GSC's Jillian Boag said: "We find ClydeWatch is a great way for teachers and children to get involved with science and the Internet – all in their local school area. And the world-wide links of GLOBE mean we can compare our data with anywhere on the planet."

E-learning Across Europe

Internationally, GLOBE-UK has developed links with GLOBE in Estonia, the Czech Republic, Holland, Norway and Poland for a new e-learning project. The six-nation partnership has successfully attracted EU funding through the Minerva strand of the Socrates programme. The project will develop e-learning materials for use in schools, based on GLOBE data but with the

emphasis on learning activities. The final products will be launched at an international conference in Estonia in September 2003 with a new website and CD-Rom. The project also involves GLOBE teachers, both in helping to develop the new materials and in trialling them in the classroom. Any teacher in the UK - at primary or secondary level - who is interested in finding out more about this exciting development in e-learning should contact the GLOBE Office for further details.

Regional Centres For Training

During the last year GLOBE has started to develop new partnerships with regionally-based Millennium Science Centres. The aim is to provide inspirational venues for GLOBE training, and regional centres to support GLOBE schools. By the end of the year four Centres had been agreed:

- The Earth Centre at Doncaster
- The National Space Centre at Leicester
- @ Bristol – at Bristol
- Manchester Museum

We intend to work with these Centres to provide hands-on training sessions for new and existing GLOBE teachers, linked with special tours of the Centres. Over time they will become a regional focus for GLOBE schools to use for information and advice. Linking a high-tech environmental project with high-tech Millennium Centres makes an ideal match. In addition, we will still be offering GLOBE training at a local level within LEAs and schools wherever there is a demand. GLOBE training works best as an INSET day, but can be squeezed into less time if necessary. The key requirements for training are a computer suite and an outdoor area, so that we can provide a hands-on experience for all.

Congratulations!

Although there is no competition in reporting GLOBE data, it is good to be able to thank all the Schools and Education Centres for their contribution to world science over the last four years. The top five reporting schools in the UK (*with the number of data collected in brackets*) were:

- Lady Joanna Thornhill Primary School, Ashford, Kent (2992)
- Woodville C.E. Junior School, Swadlincote, Derbyshire (733)
- Curry Rivel Primary School, Curry Rivel, Taunton, Somerset (563)
- Northfields Upper School, Dunstable, Beds (516)
- Worthern C.E Primary School, Shropshire (365)

And the top five reporting Education Centres were:

- Stibbington Centre, Peterborough (4913)
- Brandon Marsh Nature Centre, Coventry (848)
- Gordon Brown Outdoor Centre, Hampshire (754)
- Severn Trent Carsington Water, Derbyshire (406)
- Stanley Head Outdoor Centre Stoke-on-Trent (372)

As a growing number of Schools and Centres across the UK collect GLOBE data, we hope to see yet more records being broken over the next year.

BT

Support from BT will see GLOBE continuing to develop for the next three years. This sponsorship will not only enable GLOBE to support more schools, but also develop new class activities in sustainable development. As Ian Wood, Environment Manager for BT says, "BT's own environmental goals and activities link closely with the GLOBE programme as well as with our wider education activities in schools. We are particularly interested in supporting biodiversity measures within the framework of Sustainable Development." You can find out more about BT's on-line education resources at www.groupbt.com/ict

GLOBE Personnel

Andy Tasker, GLOBE UK Country Co-ordinator

Suzanne Welch, GLOBE Advisory Teacher

Sarah Oakley, GLOBE Advisory Teacher (*to Feb 2002*)

Lisa Ambler, GLOBE Advisory Teacher (*from June 2002*)

Jane Adjei and Sue Pybus, GLOBE Administration