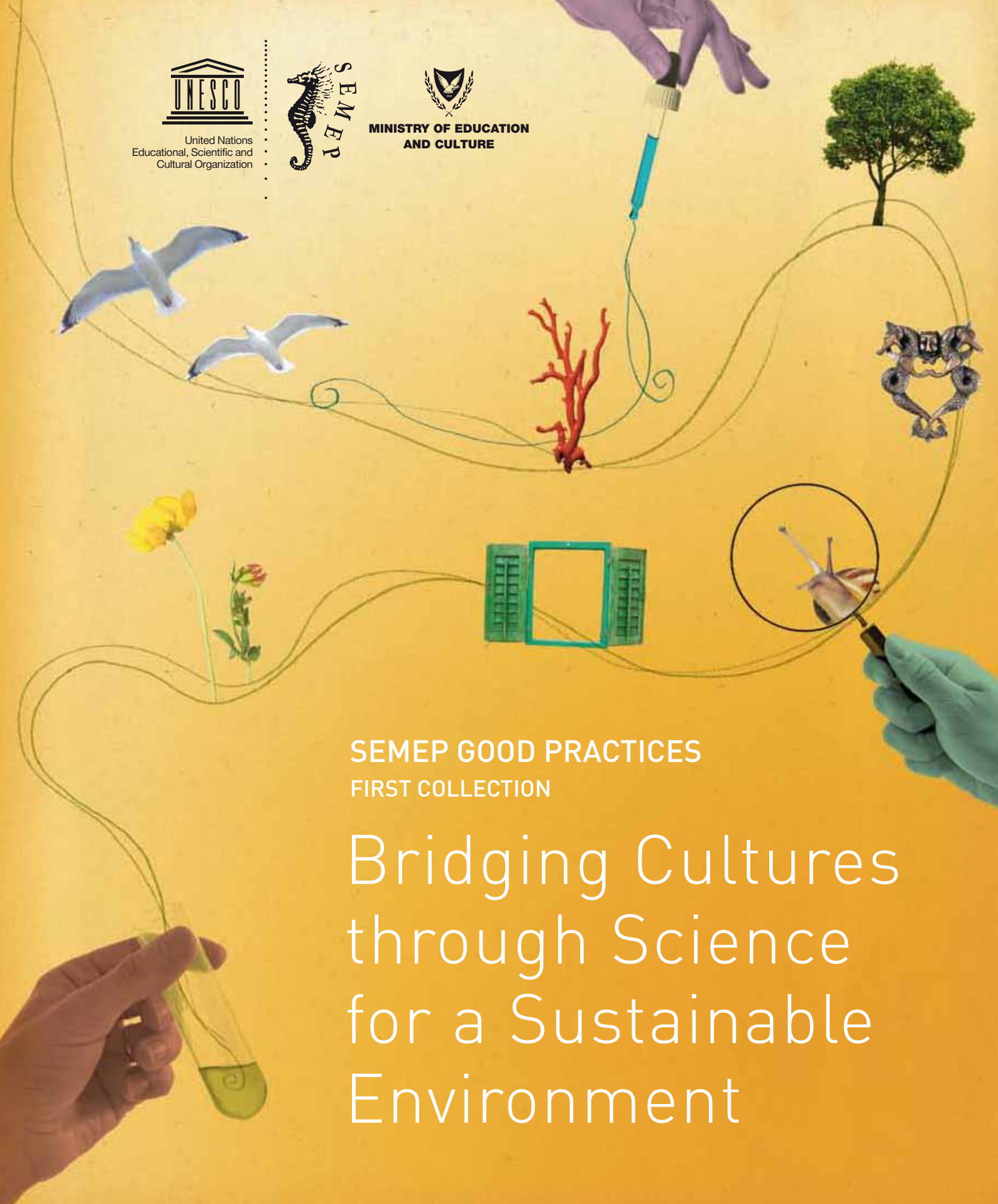

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SEMEP

MINISTRY OF EDUCATION
AND CULTURE

SEMEP GOOD PRACTICES

FIRST COLLECTION

Bridging Cultures through Science for a Sustainable Environment

United Nations
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Bridging Cultures through Science for a Sustainable Environment

The **South Eastern Mediterranean Environment Project (SEMEP)** presents here its "Good practices" publication entitled **"Bridging Cultures through Science for a Sustainable Environment"**. This initiative promotes education for sustainable development and provides examples of good practice, while generating ideas and concepts that enhance policy development.

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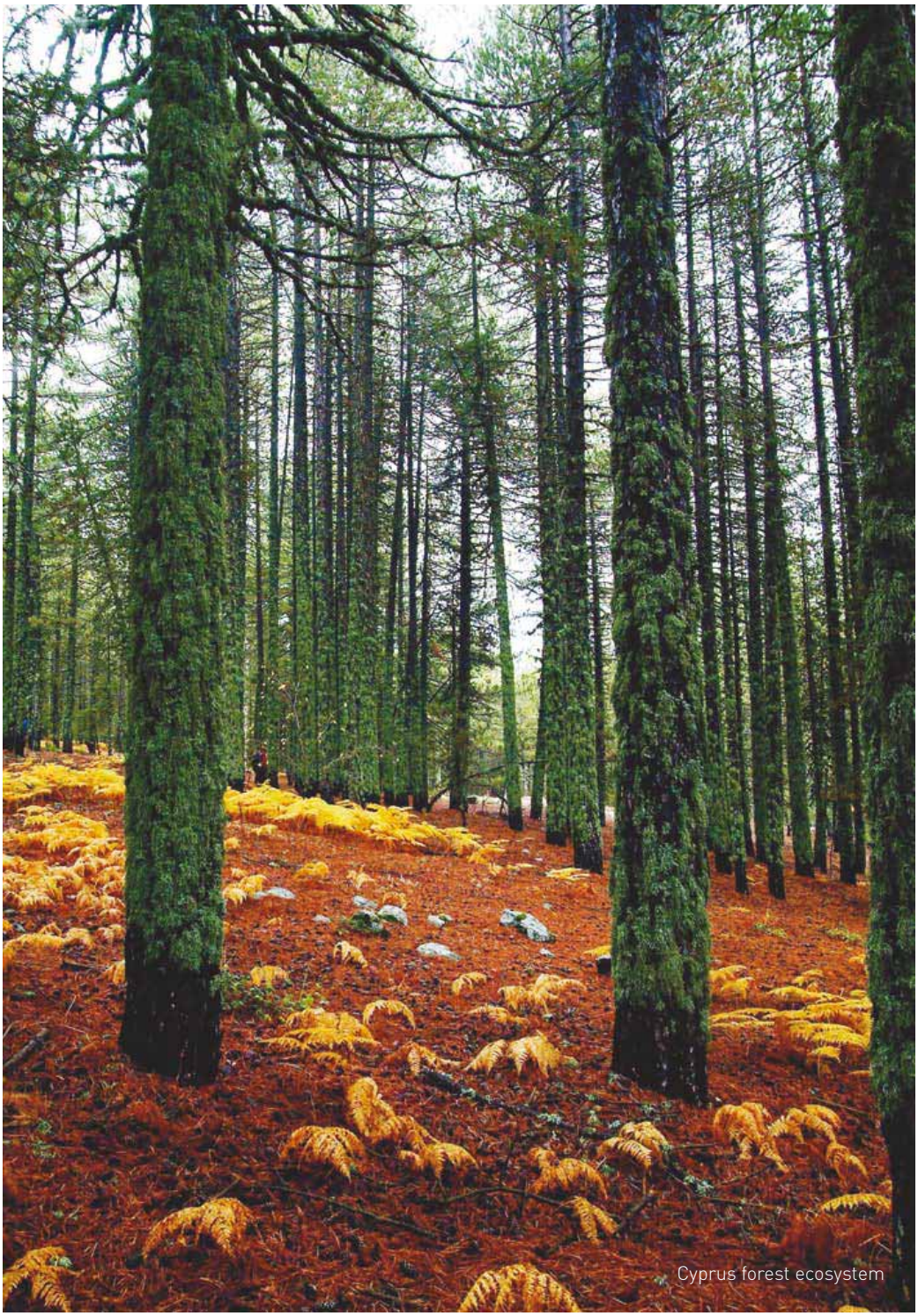


Cyprus forest ecosystem

South Eastern Mediterranean Environment Project (SEMEP)

SEMEP is an interdisciplinary environmental education project focusing primarily on the South Eastern Mediterranean Sea and the Black Sea region. Member countries include: Bulgaria, Croatia, Cyprus, Egypt, Greece, Israel, Italy, Jordan, The Palestinian Authority, Romania, Slovenia, and Turkey. The project promotes education for sustainable development through science and intercultural dialogue and concerns the Education and Natural Science Sectors of UNESCO.

SEMEP was launched at UNESCO's General Conference in 1993. SEMEP has become a platform for dialogue and cooperation among its National Coordinators and is reaching beyond the school to the community and to politicians. Intercultural dialogue over the whole region has been promoted in particular through the development of student exchanges between SEMEP countries. Over 5000 students and over 300 teachers are currently actively involved in SEMEP.

The penultimate 16th SEMEP meeting, which was held in Cyprus in May 2011 with the help of the Participation Programme of UNESCO, focused on good practice in education for bridging cultures and for sustainable development based on scientific methodology. For the enhancement of SEMEP's visibility, this booklet has been prepared consisting of one best-practice from each SEMEP country.

How does this initiative relate to the national priorities of Cyprus?

A plan of how science can be integrated with an environmental awareness of sustainability is currently being promoted through Cyprus SEMEP, which supports the implementation of the New 2010 National Curriculum. As part of the new science curriculum guidelines the students collect and record data, analyse their data and draw conclusions. Cyprus SEMEP has underlined the importance of the student projects to fulfil the above requirements. Students representing SEMEP schools communicate their results in seminars that take place in an environmental centre. At these seminars students' projects are evaluated by teacher instructors and science academics through a round table discussion. Student presentations are finally published on the UNESCO National commission web page (www.unesco.org.cy). A good practice publication was prepared and presented by Dr. Constantinos Phanis, SEMEP National Coordinator, on behalf of Cyprus, at the Science and Mathematics Education Conference (SMEC 2010), which took place on the 16th and 17th of September at Dublin City University.

Quote: "The SEMEP 2009-2010 project has produced innovative practices and the SEMEP network shows ways to develop regional and international understanding" (Minutes of the 15th Meeting of SEMEP National Coordinators, UNESCO, Paris, 2010).

With SEMEP a new pedagogic approach is promoted involving pupils and teachers more actively, engaging them in experiments which allow the integration of knowledge through science to develop skills necessary for scientific research. Cyprus National Curriculum reform effort is currently stressing the need to integrate or make connections between disciplines that are part of the curriculum.

The Cypriot SEMEP project brings together a team of teachers and academics to discuss the scientific methodology of students' research projects on Social and Natural Sciences which include:

- The observation / identification of a social and ethical dilemma.
- The planning of research.
- The collection of data.
- The interpretation and analysis of data.
- The evaluation stage and the drawing of conclusions.
- The communication stage- report writing/ publishing.

The learners in Cyprus initiative:

In Cyprus thirteen secondary schools participate in SEMEP with the involvement of teachers and students from the natural and social sciences, such as biology, physics, chemistry, geography, economics, history and languages. This interdisciplinary environmental education project aims to foster knowledge, awareness and understanding of the common historical, social, cultural, ecological and ethical heritage through science in order to promote a culture of peace and tolerance between and within countries. SEMEP schools in Cyprus maintain a geographic balance (including both rural and urban areas from all districts of Cyprus), and students are encouraged to communicate the scientific results that relate to their lives both to their local community and to the SEMEP network.

Random sampling of an endangered plant species

Approaches used for this initiative:

A new innovative working template was developed in Cyprus to provide guidance to teachers and students on how the use of scientific methodology can lead to enhanced awareness and understanding of the common historical, social, cultural, ecological and ethical heritage of different countries in order to promote a culture of peace and tolerance between them. It attempts to improve monitoring procedures, data collection, evaluation and reporting in ways that can lead to innovative projects.

SEMEP Working Template

1. A teacher/coordinators' training seminar takes place at a Centre of Environmental Education (each October).
2. The research topic and methodology of each SEMEP school is approved (each December).
3. A National two-day student seminar takes place at Pedoulas Centre of Environmental Education (each March). At the seminar the students' projects are evaluated by the teacher instructors and science academics through a round table discussion.
4. The SEMEP projects are submitted to the Cypriot Research Competition "Students in Research and Evaluation" .
5. Student presentations are published on the internet (www.unesco.org.cy).
6. A SEMEP partner school visit is planned.
7. An international summer school is planned.

Assessing the species diversity of two different stream sites

Presentation of results and impact of the initiative

SEMEP students submit and present their projects in the Cypriot competition "Students in Research" organized by the Research Promotion Foundation (RPF), in collaboration with the Ministry of Education and Culture. The research work is assessed in accordance with the procedures of the RPF evaluation; The Special Committee for Evaluation, consists of one (1) scientist - researcher with significant experience in educational research, one (1) representative of the Ministry of Education and Culture and one (1) representative of the RPF.

SEMEP schools' activities include interviews, photography, nature walks, research through the web, visits to universities, zoos, wineries, sand dunes, wild life parks, hospitals, dairy industries, fish farms, research institutes and environmental centres in order to investigate social and/or ethical dilemmas so as to acquire new knowledge through a designed scientific methodology.

The role of the teachers during the project is to facilitate the work of students. At all times during the project, from initial planning to writing up, the students are encouraged to discuss their ideas with the teacher and their team. The writing of the report is entirely the students' work and at least five students of mixed ability collaborate on the same topic, which in most cases is an issue of particular concern to the school's local community. The report is then word processed and presented as a power point presentation. At the student seminar the students link scientific research with their awareness and understanding of the common historical, social, cultural, ecological and ethical heritage of the Mediterranean region. The students at the Centres of Environmental Education also participate in designed experiments such as:

1. Habituation of a giant Mediterranean snail to a stimulus.
2. Quantitative sampling of endemic plants and animals.
3. Examining antimicrobial properties of plant extracts.
4. Assessing the species diversity of two different stream sites.

SEMEP Future Evolution

The SEMEP theme for 2010-2011 was "Rapprochement of cultures through science for sustainability". The annual conference brought together the National Coordinators of SEMEP, Science and Environmental Education Specialists and UNESCO representatives. The coordination aims included:

- The presentation of the work carried out by the participating countries.
- The discussion of future projects within the network.
- The exchange of ideas and best practices.
- The decision of the theme for the following year.

The philosophy of SEMEP is to connect subject areas because in the real world people's lives are not separated into distinct subjects. It is imperative for schools to teach more effectively in order to foster scientific literacy, rather than cover more content. SEMEP provides a multitude of educational approaches developed in favour of sustainability and contributes good practices at local, national, regional and international levels. The SEMEP project promotes the development of discovery skills and enhances communication thus encouraging the personal involvement of students. It aims to develop a new, positive relationship between students, between teachers, and between knowledge and learning through science and culture. SEMEP has been adopted by the Cypriot Forestry Department which allows students to assist foresters with monitoring the abundance of endangered species located in all regions of Cyprus. Cyprus SEMEP project is designed to promote science, mathematics, technology and culture. Questions such as "What do you think about this particular issue?", elicit the students' prior conceptions. The ecosystem itself engages and motivates students by arousing their interest. Actively engaging with the ecosystem itself motivates the students to explore the environment under investigation, make predictions and develop hypotheses. Next they design experiments, collect and analyse data, draw conclusions and propose solutions. Various degrees of teacher and student ownership and control are possible. New concepts are introduced and new terms are explained.

The 17th National Coordinators meeting, which took place in the Danube Delta Biosphere reserve, Romania from the 14th to the 17th of June 2012, with the support of Veolia, Apa Nova from Bucharest, focused on biodiversity and the sustainability of the Danube Delta.

Until 2010, the SEMEP project was supported by the Division for the Promotion of Basic Education and the Division of Basic and Engineering Sciences at UNESCO. Close collaboration will continue with UNESCO, especially with the recently created cross-cutting unit on Science Education in the Natural Sciences Sector.

Dr. Constantinos Phanis, Cyprus SEMEP National Coordinator

The key stakeholders in this initiative are the following organizations:

1. **The Cyprus Ministry of Education and Culture**
   The National Coordinator, Dr. Constantinos Phanis, has been allocated one day per week at the Ministry of Education and Culture to supervise the programme. Teachers from 12 public schools and one private school have been allocated one period per week to guide the students who participate in the programme. The inspector of geography, Dr. Giannakes Koumides, is the supervisor of Cyprus SEMEP initiative.

2. **UNESCO**
   SEMEP is supervised by the Division for Basic Education and Natural Sciences.

3. **The Cyprus National Commission for UNESCO**
   Facilitates the work between UNESCO and national coordination of SEMEP.

4. **The Cyprus Centres of Environmental Education**
   Support Teacher Training Seminars; Student Seminars; International Summer Schools; Student Environmental, Cultural and Scientific Investigations.

5. **The Pedagogical Institute in collaboration with the RPF**
   The Cyprus Pedagogical Institute (http://www.pi.ac.cy)
   Responsible for the in-service training and the professional development of teachers at all levels and all posts. It organises and delivers in-service training for all subjects and cross subject areas, educational technology, educational research and also school based development.

6. **The Forestry Department**
   Foresters collaborate during field expeditions.

7. **Researchers**
   Academics from institutions including state and private universities in Cyprus contribute to the project in the following ways: Supporting the Social/ Ethical and Scientific knowledge generated / developed during teacher and student seminars.
   Organizing and designing experiments that allow students to interpret data and evaluate scientific methodology.

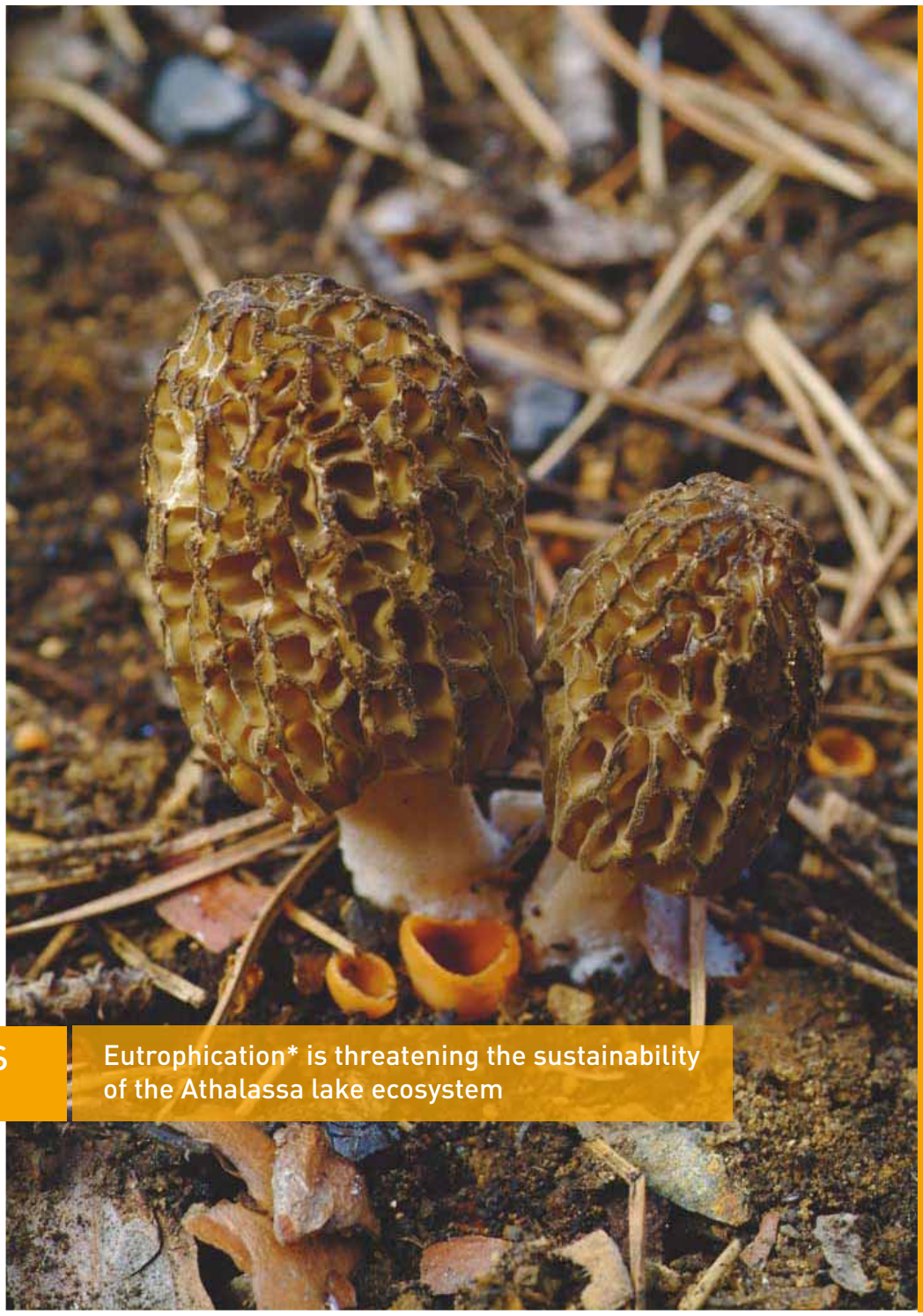
Examining antimicrobial properties of plant extracts

SEMEP PROJECTS CARRIED OUT BY CYPRIOT SCHOOLS (2010 - 2011)

1. **How the Lessepsian Migrants affect the biodiversity of the Eastern Mediterranean Sea**
   Name of school: Fote Pita Lyceum, Ammochostos
2. **Desertification, the case of Cyprus**
   Name of school: Apostle Paul Gymnasium, Paphos
3. **Urban heat islands and human thermal comfort in the built environment**
   Name of school: Saint Nicolaos Lyceum, Limassol
4. **Obesity**
   Name of school: Makarios 3rd Lyceum, Larnaka
5. **Recycling**
   Name of school: Makarios 3rd Lyceum, Paphos
6. **Study of the Lake mine**
   Name of school: Saint Neophytos Lyceum, Paphos
7. **Biodiversity of Fungi**
   Name of school: Kato Pyrgos Gymnasium/Lyceum and Panagias Gymnasium
8. **Mobile phones and the world around us**
   Name of school: Lyceum Saint Ioannes, Limassol
9. **Water quality**
   Name of school: Lyceum and Technical school Polis Chrysochous, Paphos
10. **Migratory bird**
    Name of school: Paralimni Lyceum, Ammochostos
11. **Assessing the species diversity of two stream areas Biodiversity of Citrus fruit**
    Name of school: International school of Paphos, Paphos
12. **The monasteries of Cyprus**
    Name of school: Gymnasium Saint Neophytos, Paphos
13. **Cyclamon Cyprium, Endemic**
    Name of school: Lyceum Saint Charalambos Embas, Paphos

Working languages: Greek and English

Crocus cyprius



CYPRUS

Eutrophication* is threatening the sustainability of the Athalassa lake ecosystem

CYPRUS

Eutrophication* is threatening the sustainability of the Athalassa lake ecosystem.

INITIATIVE DESCRIPTION IN BRIEF

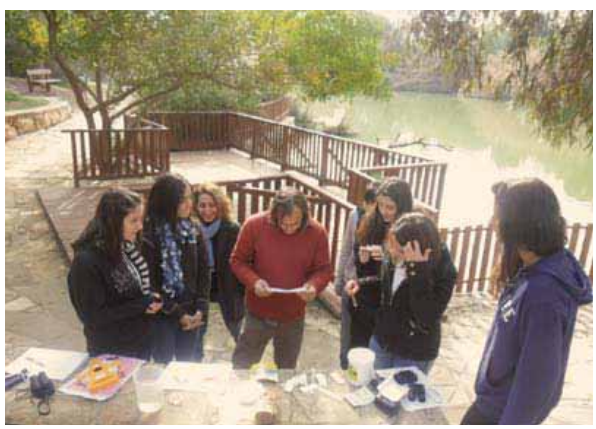
Athalassa national park, which covers an area of 8.6 km² is situated south of Nicosia and overlooks the Pentadactylos mountain range to the North of the island. The park comprises two picnic areas, roads, bicycle tracks, pedestrian lanes, sports grounds, parking places, the picturesque lake of Agios (Saint) Georgios, a bird observation point, a botanical garden and an Environmental Education Centre.

In the Cyprus Mail newspaper of March 6, 2012, the following report appeared,
... "An official for the Department of Fisheries and Marine Research has told the Cyprus Mail that around two and a half tonnes of dead fish have so far been fished out of Agios Georgios / Athalassa lake after perishing during the long bout of cold weather in the capital."

Seven SEMEP students and a SEMEP chemistry teacher from Apostle Barnabas senior school, which is located in Nicosia, visited the Centre for Environmental Education in Athalassa park to record and inspect the fish death and discuss with a researcher the appropriate scientific methodology for the investigation of the mysterious event. The role of the researcher and the SEMEP teacher during the project was to facilitate the work of the seven students. At all times during the project, from the initial planning to the write up stage, the students collaborated closely with each other and were encouraged to discuss their ideas with the teacher and their team. The writing of the report was entirely the students' work.

* Eutrophication is the process by which a body of water becomes enriched in dissolved nutrients, especially nitrates and phosphates, that stimulate the growth of aquatic plant life usually resulting in the depletion of dissolved oxygen.

Name of School: Apostle Barnabas Lyceum, Nicosia, Cyprus.
Age and number of students: 16 to 17 years old; 7 students.
Project Teacher: Stavroula Ziepra, Chemistry teacher.



Collecting and recording data

Objectives:

1. To formulate the hypothesis: "The mass fish death is due to the eutrophication of Athalassa lake".
2. To investigate the above hypothesis using scientific methodologies.
3. To investigate the social and ethical dilemmas of a eutrophic lake ecosystem.
4. To spread knowledge and understanding regarding the cultural heritage of Athalassa park.
5. To bridge cultures via comparison with other sustainable Mediterranean lakes.
6. To raise awareness about the need to protect fresh water biodiversity.
7. To communicate to the SEMEP network how the scientific results obtained by the students affect their lives in their local community.

Funds:
The Pedagogical Institute
The Cyprus Ministry of Education and Culture
The Research Promotion Foundation (RPF)

Recording the concentration of dissolved oxygen in the water

RESULTS AND EVALUATION OF THE INITIATIVE

The SEMEP student activities included interviews of the foresters and researchers at the Athalassa National Park, photography, nature walks, research through the web and visits to the Environmental Centre of Education in order to investigate their hypothesis and the social and ethical dilemmas presented by the eutrophic lake.

New knowledge was acquired through a designed scientific methodology.
The students:

1. **Observed and identified the social and ethical dilemmas related to eutrophication and learnt how to formulate a hypothesis.**

2. **Planned their research.**

3. **Collected and recorded data for the Athalassa lake** including:
   - nitrate concentration
   - phosphate concentration
   - pH
   - temperature
   - turbidity
   - growth of bacteria
   - concentration of dissolved oxygen in the water

4. **Analysed and evaluated their data.**
   - High concentrations of nitrates and phosphates were recorded when compared to control values. Nitrates and phosphates are plant nutrients and can cause plant life and algae to grow quickly. When plants grow quickly, they also die quickly. This contributes to the organic waste in the water, which is then decomposed by bacteria. This results in a high Biological Oxygen Demand (BOD) level. BOD is a measure of the oxygen used by micro-organisms to decompose organic matter such as dead plants, leaves, grass cuttings, manure, sewage, or even food waste present in water.
   - Low levels of dissolved oxygen. Micro-organisms such as bacteria are responsible for decomposing organic waste. When organic matter is present in a water supply, the bacteria will begin the process of breaking down this waste. When this happens, much of the available dissolved oxygen is consumed by aerobic bacteria, robbing other aquatic organisms of the oxygen they need to live. If there is a large quantity of organic waste in the water supply, there will also be a lot of bacteria present working to decompose this waste. In this case, the demand for oxygen will be high (due to all the bacteria) so the BOD level will be high.
   - Increased amount of anaerobic organisms such as coliforms. These bacteria are commonly used as indicators of water pollution, but not an actual cause of disease.
   - The pH of the water was within the normal range of 6-7.
   - The minimum temperature observed at the time of investigation was 11.2° C.
   - The water was largely cloudy.
   - There were dead fish floating in the water of a type called Tilepi (Oreochromis sp).

5. **Drew conclusions.**
   Eutrophication in Athalassa lake is confirmed. Negative environmental effects include hypoxia, the depletion of oxygen in the water, which induces reductions in specific fish such as the Oreochromis sp.

Dead fish in Athalassa lake

6. Discussed possible solutions to eliminate eutrophication in Athalassa lake.

- Installing fountains or an oxygen pump to increase the quantity of dissolved oxygen thus avoiding accumulation of anaerobic pathogenic microorganisms.
- Prohibiting public feeding of fresh water wild-life using information boards that explain eutrophication.
- Reducing the amount of fertilizers used in the forest park.
- Draining the lake.
- Using advanced technology to produce an environmentally safe fluid waste stream and solid waste suitable as farm fertilizer.
- Continuous monitoring and assessment of eutrophication of Athalassa lake.

7. Communicated and published their report.

During the annual National two-day student seminar that took place at Pedoulas Centre of Environmental Education, the students presented their scientific research. This was then evaluated by the SEMEP teacher instructors and science academics through a round table discussion.

Pleurotus ostreatus

How the initiative served to implement the theme of SEMEP for 2010-2011, "Bridging Cultures through Science for a Sustainable Environment"

The idea of Cyprus SEMEP project is to connect subject areas. This is because in the real world, people's lives are not separated into different subjects; therefore, it seems only logical that subject areas in schools should not be separated either. Cyprus 2010 National Curriculum reform effort is currently stressing the need to integrate or make connections within the curriculum. This particular project is considered to be a good practice because it demonstrates how science and an environmental awareness of sustainability can be integrated into all educational subjects. The project has integrated knowledge from several subject areas, namely, biology, chemistry, maths, technology, economics, literature and history. This project has also followed the innovative Cyprus SEMEP template (see introduction), presented in the 15th Meeting of SEMEP National Coordinators, UNESCO, Paris, 2010, which is as follows:

1. A teacher/coordinators training seminar took place at Pedoulas Centre of Environmental Education (October 2011).
2. The Research topic and methodology of each SEMEP school was approved (December 2011)
3. During the National two-day student seminar at Pedoulas Centre of Environmental Education (March 2012) the students' projects were evaluated by the teacher instructors and science academics through a round table discussion.
4. Student presentations are published on the UNESCO national commission web page (www.unesco.org.cy) and the school web page.
5. The SEMEP project was submitted in the Cypriot Research Competition "Students in Research" which is supported by the the Cyprus Ministry of Education and Culture.
6. A SEMEP partner school visit is planned for the future.

Why do you consider this to be a good practice?

The SEMEP students presented their research through a power point presentation during the Cypriot competition "Students in Research" organized by the Research Promotion Foundation (RPF), in collaboration with the Ministry of Education and Culture. The research work submitted to the RPF was assessed in accordance with the procedures for evaluation (see introduction). The SEMEP Student Research entitled 'Eutrophication is not just a threat to fish biodiversity but it is also threatening the sustainability of the Athalassa lake ecosystem', received an award from the RPF in its research competition in which 35 other high schools competed. This initiative has been exported to other cities facing similar problems in the Mediterranean region. The SEMEP network shows innovative ways to develop regional and international understanding. SEMEP supports teacher training and provides guidelines to support curriculum reform and implementation.

SEMEP incorporates two overarching strategic UNESCO initiatives, specifically:

- strengthening science, technology and innovation ecosystems, and
- mobilising international science communities to address pressing challenges that cannot be addressed by any one nation alone, thereby encouraging a culture of peace and non-violence.

National Coordinator of Cyprus

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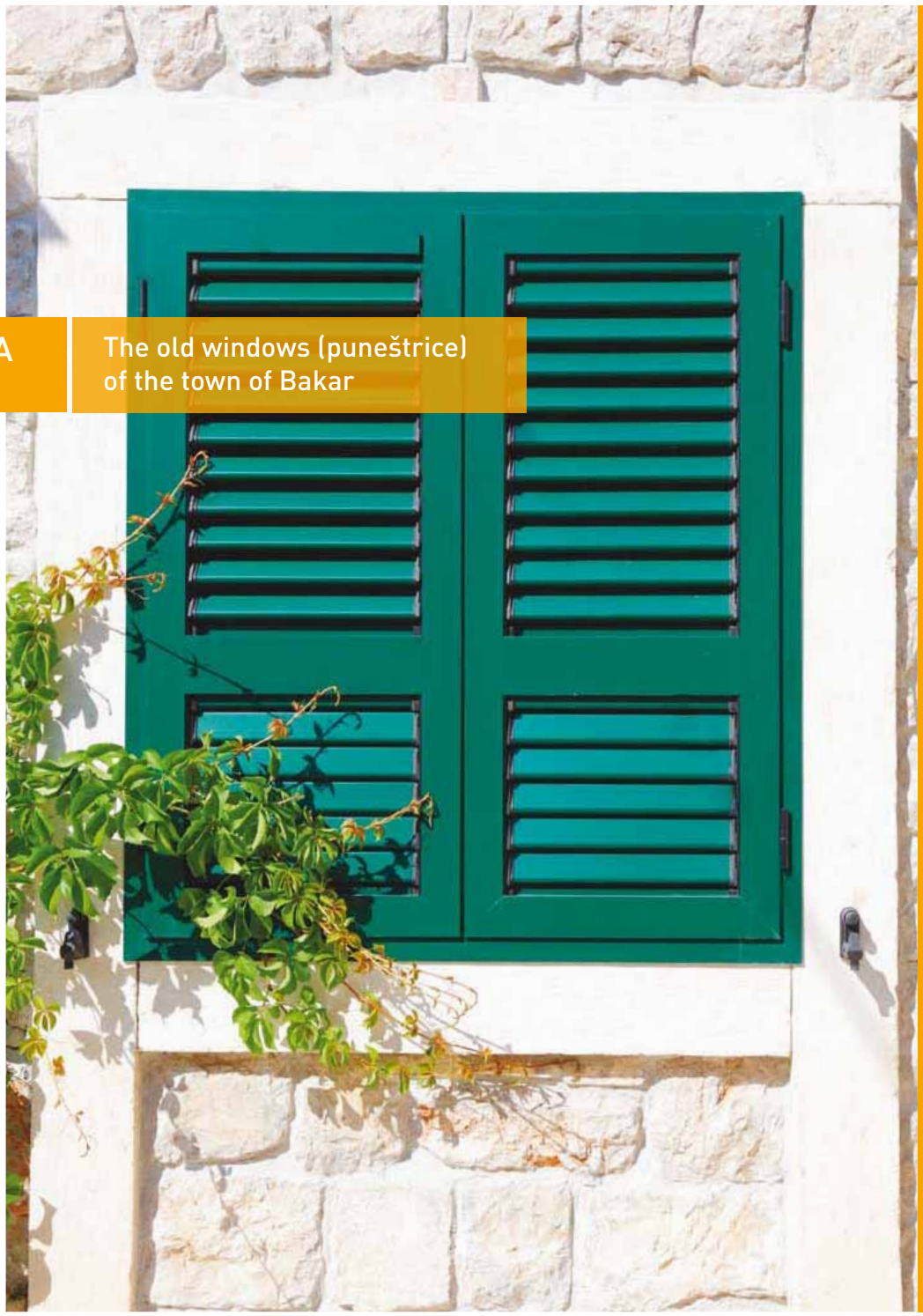

CROATIA

The old windows (puneštrice) of the town of Bakar

CROATIA

The old windows (puneštrice) of the town of Bakar

INITIATIVE DESCRIPTION IN BRIEF

Our Maritime School, which was established in 1849, is located in the old town of Bakar, on the north Croatian coast. The building is situated at the north end of the long Bakar bay. Bakar is a typical Mediterranean town. It is set against blue skies, bordered by pine woods and dotted with olive trees, and its buildings are chiefly stone houses inhabited by fishermen and seafarers. Bakar has charming narrow streets running between these densely built houses, and their traditional windows are their most striking and colourful feature. These windows are reminiscent of other Mediterranean towns, such as Naples, Marseilles, or Barcelona. The exhilarating breeze of the Mediterranean sea enters the houses through these often brightly painted windows, filling the rooms with envigorating fresh air.

As these houses were built so closely to one another, there were no yards in which people could sit and exchange news over a dividing fence or wall. Consequently the people developed the habit of communicating via their windows. All their daily worries, joys and sorrows were passed from one neighbour to another through these windows. Lately, however, people have started to substitute these wooden windows with plastic ones. The result has been the replacement of the town's once authentic, antiquated appearance with one that is artificial, inapt and even tasteless.

Name of School: Maritime School, Bakar.
Age of students: The project was carried out by a group of 10 students (age of students 16-18) from different classes.
Project coordinators: The teachers, Marica Kučan, Radijana Tomee-Cicvarić and Katja Šepić provided assistance with the project, which was also supported by the headmaster, Mr. Gordan Papeš.

The 13th Croatian SEMEP Summer School, Komiža

Objectives:

1. To establish a Scientific methodology for window classification based on colour, shape and size.
2. To promote knowledge and understanding regarding cultural heritage.
3. To bridge cultures via comparison with windows in other Mediterranean locations.
4. To raise awareness about the need for the protection of old Mediterranean windows.

Funds:
The project was supported by school funding from extra-curricular activities.

RESULTS AND EVALUATION OF THE INITIATIVE

To begin with, a group of students took photographs of typical windows in Bakar. They classified them and drew up lists according to different types, colours and dimensions. Then they compared these shapes and colours with wooden windows in other Mediterranean countries (i.e. Greece, Turkey, France, Spain, Italy). They concluded that the windows were all very similar.
Sadly, the research revealed that there are lots of dilapidated windows in Bakar. These have been ravaged by time; blasted by the wind known as the Bakar "bora" and drenched by centuries of rain. Their once bright colours are now faded due to corrosion from sea salt. Understandably, people have started to replace their wooden windows with plastic ones, the result, however, has been to drastically alter the appearance of the town. The loss of this authentic architectural feature has meant that the houses now look charmless and incongruous, having lost their former antiquated, picturesque appeal.

The miniature replicas of windows in Bakar

In an effort to inform the community about this local development our students devised a Power Point Presentation. They presented it to other students in all classes. They showed them the windows of other Mediterranean countries and compared them with those in Bakar. As we have students from other towns in the school, they had a discussion about the protection of old wooden windows in their communities. Some students wrote poems about the windows, others made miniature replicas of them. Finally, the project was published in the school magazine, on the school website and was also featured on "RADIO BAKAR".

The students feel that it is the task of local authorities to find ways of preserving old, wooden windows. We wrote to them suggesting they establish an initiative to protect old windows as a manifestation of our cultural heritage. Old and dilapidated windows should be replaced with new ones and local authorities should support and give incentives for the repair and replacement of deteriorating wooden windows, at the same time forbidding the use of plastic ones within the old city of Bakar. This initiative should be exported to other cities in the Mediterranean area which face similar problems. This can be done through SEMEP collaboration.

How the initiative served to implement the theme of SEMEP for 2010-2011, "Bridging cultures through science for a sustainable environment"

1. Two pupils from the Maritime School of Bakar, Mateo Njegovan and Sanjin Šuštić, took part in the SEMEP Summer School on the Island of Vis, Croatia, where they presented their project. There were pupils present from other islands and towns on the Adriatic coast with the same problem in their cities. We all came to the same conclusion: there is a need to preserve our history and that the preservation of objects and artefacts that convey and transmit this history is a vital part of the process/is crucial to fulfilling this aim
2. The project was presented at the National Competition of EcoSchools in Pula 2011
3. The project was presented in Cyprus

Why do you consider this to be a good practice?

As a consequence of their participation in the project the students became more sensitive towards architectural features that characterize certain Mediterranean countries. Firstly, the students were directly and practically involved in the issue. They researched the topic and came up with conclusions and solutions, namely, that there is a need to protect these wooden windows because they represent an important aspect of our history.

In addition, via this project we raised the pupils' awareness of our cultural heritage and its significance. We helped them to look upon their immediate surroundings from a fresh perspective, constantly seeking new and interesting items to study and appraise.

The students were especially interested in creating a new taxonomy for old windows and worked with great enthusiasm. Our conclusion is that this initiative should be promoted to other cities with the same problems in the Mediterranean region.

It is very clear that UNESCO's SEMEP is an important supplement to conventional methods of teaching and learning. SEMEP has the resources to assist and provide support to teachers, and to stimulate students to work by providing them with a learning environment in which they can develop skills that are seldom emphasized within the formal curriculum. SEMEP should therefore be evaluated on the basis of its success within these parameters. SEMEP is an invaluable educational project which has had a great impact on both students and teachers in Croatia and the wider Mediterranean region in the field of education for sustainable development.

SEMEP activities in Croatia

In Croatia there are currently 40 schools participating in SEMEP (the majority of which are secondary schools), with populations of around 500 students and one hundred teachers both in coastal and continental areas. To date we have organized 13 SEMEP SUMMER SCHOOLS on the Island of Vis, presented more than 300 school projects with the participation of more than 500 students and 100 teachers. We have also held a significant number of teacher-training seminars, always in different parts of Croatia. In addition, SEMEP has been presented at conferences in Croatia and abroad. Finally, we have printed the publication TEN YEARS OF SEMEP SUMMER SCHOOLS, VIS.
More information is available on the web site www.semep.hr

National Coordinator of Croatia

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GREECE

From the farmer's field to our dishes,
Bio-food versus junk food

GREECE

From the farmer's field to our dishes, Bio-food versus junk food

INITIATIVE DESCRIPTION IN BRIEF

What is the Ecological Footprint of each one of us? What is the life cycle environmental impact of typical Mediterranean products like olive oil, honey and certain vegetables, and of some other common foods such as meat, rice and fruit?

Two collaborating teams of students were established in order to carry out interdisciplinary teamwork concerning the Mediterranean diet and its benefits for human health and the environment. An investigatory project was established in order to assess the value of a Mediterranean diet in contrast to a diet of junk-food.

The first team submitted their findings to SEMEP within the framework of the initiative entitled "Rapprochement of cultures through science for sustainability". The second team presented their results as part of a COMENIUS project mobility action in Poland, within the framework of the COMENIUS project entitled "Climate change and modern lifestyle in the European region - Developing ways towards sustainability with a special focus on food".

Name of School: "Peiramatiko Lykeio Evanghelikis Scholis Smyrnis", an upper secondary school in Nea Smyrni, Attica.
Age of students: The students were 15-16 years old.

Objectives:

1. To establish a scientific methodology to investigate the nutritional habits of young people and adults.
2. To investigate the effects of diet on health as well as on the environment.
3. To investigate what we should eat in order to live in a sustainable way.
4. To investigate the awareness of cultural and regional differences in the South Eastern Mediterranean region concerning nutrition and lifestyle.

Funds:
The COMENIUS project funded visits to other schools and communication - collaboration between students and teachers from other North European countries.

RESULTS AND EVALUATION OF THE INITIATIVE

The participants:

1. Discovered the "food miles" relating to the cycle from food production to the final disposal of its waste.
2. Compared the Guideline Daily Amounts (GDA) for an adult to the energy content and ingredients of a fast-food meal.
3. Experimented on the degradation impact of a homemade sandwich and a similar fast food hamburger.
4. Created the "Ten keys to a healthy diet" list.
5. Discovered the definition of "sustainable" food production.
6. Engaged in social intervention through presentation at the school, as well as to the local community.

Comenius project

How the initiative served to implement the theme of SEMEP for 2010-2011, "Bridging Cultures through Science for a Sustainable Environment"

The students had a unique opportunity to become acquainted with inquiry learning procedures and cooperative teamwork, which are usually absent from normal curriculum activities. In the process they:

1. Dealt with general interest subjects.
2. Considered issues related to their everyday lives.
3. Selected the topics which they would like to investigate and planned their surveys, activities and methods.
4. Became acquainted with the scientific methods of collecting, analyzing and evaluating data, and developed their critical thinking, problem solving and decision making skills.
5. Used the English language to communicate with students from other countries.
6. Practised and utilized informatics and related technologies for both communication and data processing.

Why do you consider this to be a good practice?

- The students developed a scientific methodology with which to guide and underpin the project.
- Students became more selective and discerning in relation to the quality of their food.
- The parents of some of the students involved in the project came to school to congratulate the teachers responsible for the project.
- We witnessed a change in the behaviour of SEMEP students with regard to a reduction in consumption of junk food from the school canteen and an increase in the consumption of homemade sandwiches as an alternative.
- Some of the modulated behaviours, in addition to the knowledge, skills and attitudes obtained, included the promotion of mutual understanding among students and a willingness to exchange opinions and negotiate attitudes towards food.

SEMEP activities in Greece

In Greece, the number of schools involved in SEMEP activities each year used to be between 15 and 20 (with fewer taking part in the past two years), involving around 20-30 students and 2-3 teachers per school project. Four two-day training seminars for SEMEP school teachers have taken place (three national and one international), with 25-30 teachers participating in each one. The 1st SEMEP Summer School, for ten students and two teachers from each country, took place in Thessaloniki, in August 1997. SEMEP activities in Greece have been presented at international meetings (e.g. at a UNESCO sister project BSP [Baltic Sea Project]) meeting in Sonderborg Denmark (June 2000), at the "Nicolae Cornateanu", agricultural school in Tulcea, Romania (September 2001), at the International Educational Exhibition DIDACTA, in Hanover, Germany (March 2006), as well as at a preparatory meeting of partner schools for a Comenius Partnership, hosted in Nacka School, Stockholm.

National Coordinator of Greece

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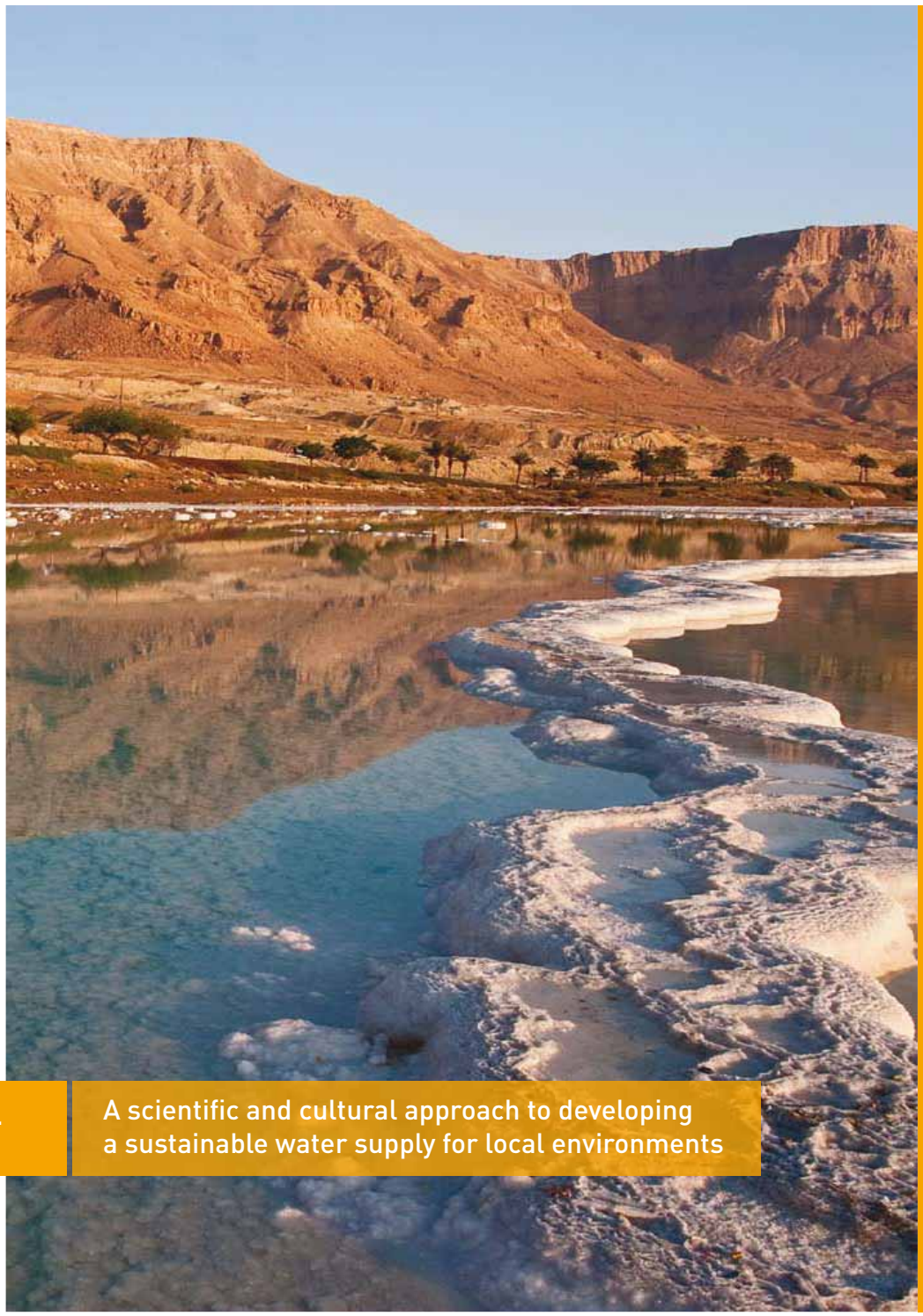

ISRAEL

A scientific and cultural approach to developing a sustainable water supply for local environments

ISRAEL

A scientific and cultural approach to developing a sustainable water supply for local environments.

INITIATIVE DESCRIPTION IN BRIEF

The new SEMEP innovative working template was implemented in Israel to provide guidance to teachers and students as to how the use of scientific methodology can lead to enhanced awareness and understanding of the common historical, social, cultural, ecological and ethical heritage. SEMEP offers a holistic framework with which to foster knowledge, awareness and an understanding of the Mediterranean region and to further reinforce a culture of peace and tolerance between countries and even between minorities inside Israel.

The New SEMEP Template in Israel

1. A teacher/coordinators' training seminar took place at the Davidson Institute, Rehovot in October 2011.
2. The research topic and methodology of each SEMEP school was approved in December 2011.
3. The students' presentations are to be published on the Israeli Ministry Website in August 2012.
4. A SEMEP partner school visit is planned for October 2012.

Working languages: English, Arabic, French and Hebrew.
Sixteen schools are involved in the SEMEP Program.

The SEMEP Program in the Jewish Sector :

A number of Jewish Schools participate in the SEMEP Program, which has been assimilated into the syllabuses for either Science and Technology or for Environmental Studies. As partners in the SEMEP initiative, Jewish schools, which are technologically equipped for science education and for the SEMEP program, support and facilitate the conceptual development, the aquisition of skills and habits of mind that constitute environmental literacy. The SEMEP Program in elementary schools is taught from the standpoint that the pupils have no prior experiences relative to the topic being studied.

A model of a plant saving irrigation system

The SEMEP Program in the Israeli - Arab Sector :

The SEMEP Program in the Arab sector is implemented as a selective program for gifted and talented students or otherwise it is implemented in groups drawn from different school classes. Furthermore, teachers from different disciplines such as Science, Geography, English, Art, Maths and Computer technology are involved in the initiative, all of whom have expressed their willingness to implement this program in their schools. SEMEP encourages Arab pupils in elementary schools to develop their critical thinking skills and to envision solutions to systems that perpetuate injustice and the degradation of the environment. Science and Environmental Education for Sustainability is integrated into all educational subjects through the 2010-2013 Israeli project which supports the implementation of the Israeli National Curriculum. The aim is to develop environmental literacy, and to advocate for an integrated approach to science through the SEMEP Program. This is accomplished through an approach to teaching that connects environmental issues, cultural issues, and initiatives for peace and non-violence as manifested in Bedouin and Druze societies by emphasizing the connection between these cultures and education for sustainability.

Funds:
Keren Kayemeth LeIsrael - Jewish National Fund provides to Israeli SEMEP Schools kits to analyze water quality.

Biodiversity of endemic and invasive species as bio-indicators of climate change

RESULTS AND EVALUATION OF THE INITIATIVE

1. SEMEP Students in Israel were awarded a certificate from the Ministry Of Education for their outstanding contribution to the SEMEP Project throughout the year.
2. A "green day" was organised with different activities for SEMEP students.
3. An Annual SEMEP Meeting was held with the collaboration of the Ministry of Education and different "green" organizations. This year, the SEMEP Annual Meeting 2012 was held at Hakibutsim College on May 22nd, 2012.

How the initiative served to implement the theme of SEMEP for 2010-2011, "Bridging Cultures through Science for a Sustainable Environment"

- Awareness and understanding of local and global scientific, technological, ecological, social, economic and cultural issues.
- Cooperation, communication and exchange of information and experiences between schools (teachers and students) from different sectors of the population (Jewish, Arab, Druze and Bedouin).
- Innovative interdisciplinary, holistic and context learning approaches.
- School-community links (material produced by students was compiled in a book, which was presented to the community).
- Environmental literacy for all.

SEMEP activities in Israel

1. Students developed a model of ground water filtration. (Junior High School from Eilat located in the South of Israel.
2. Students observed, measured and recorded important habitat features that influence the types of aquatic organisms present in ponds located near the school area.
3. Students Collaborated with other SEMEP schools in the local & in the international level.

Through SEMEP students develop analytical skills and problem-solving strategies in solving major water issues.

National Coordinator of Israel

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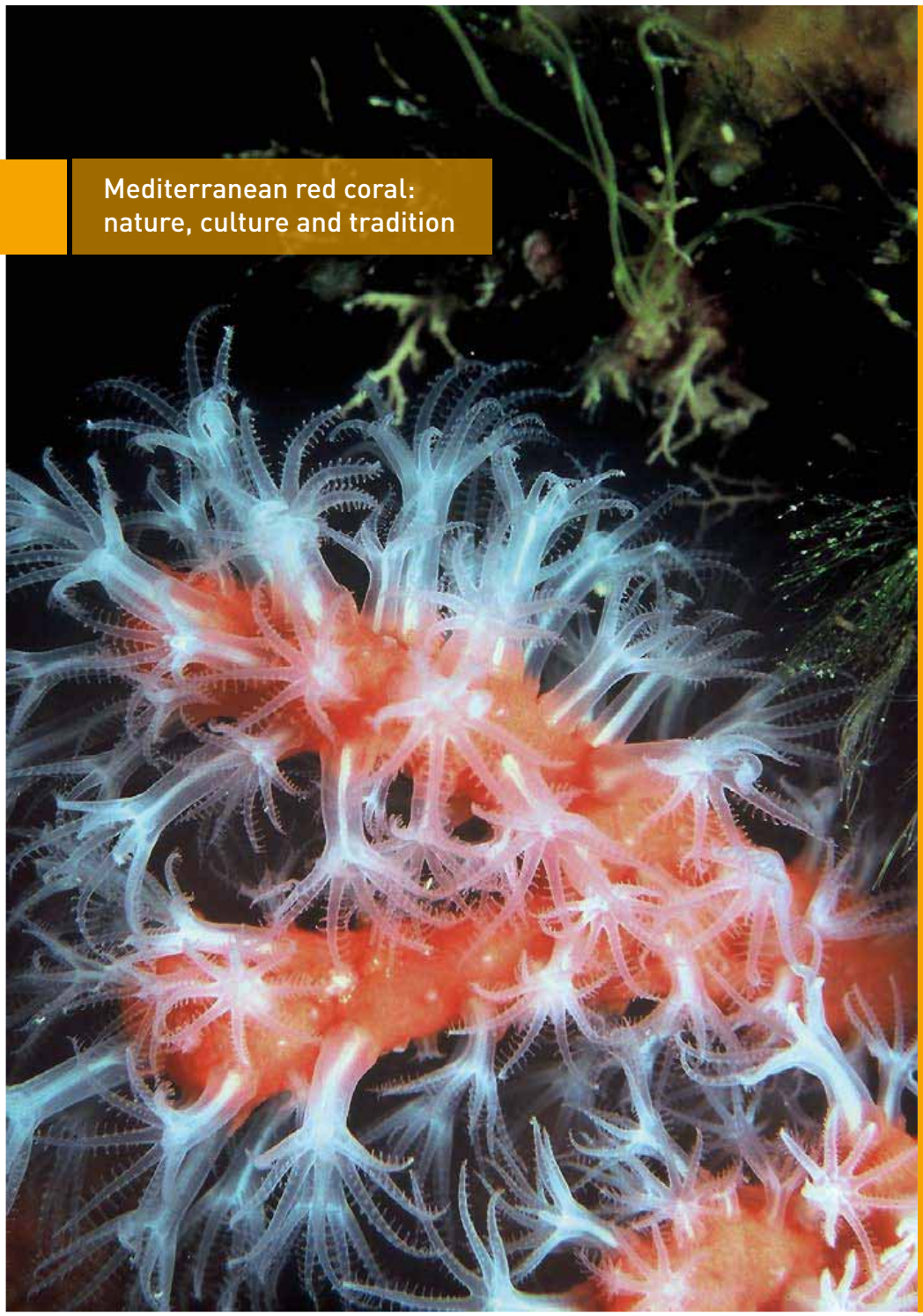
ITALY

Mediterranean red coral: nature, culture and tradition



ITALY

Mediterranean red coral: Nature, culture and tradition

INITIATIVE DESCRIPTION IN BRIEF

Coral, which has been very important for the economy of the Mediterranean region, is currently threatened by pollution, excessive maritime traffic and over-exploitation. The coral collected off the coasts of Italy, namely those of Calabria, Campania, Latium, Tuscany, Liguria, Sicily, and Sardinia, was the most carved coral throughout the 19th century. This was equally the case for the coasts around Greece, Croatia, Corsica, France, Spain and Morocco. This particular coral, Corallium rubrum, is generally red with darker red or scarlet shades and it can be found at depths ranging from 30 to over 150 metres. However, some of the above-mentioned Mediterranean zones are no longer productive. Moreover, due to certain environmental factors, at present, coral fishing is subject to specific regulations which further limit its collection. All this has serious implications for the region of Torre del Greco, which has a tradition of coral carving extending over two centuries. Consequently, an inter-disciplinary investigation into the current state of corals in the region was carried out linking myth, history, tradition, and science.

Red Corals

Name of School: C. Cavour, Lower Secondary School of Marcianise, Southern Italy.
Age and number of students: 120 students: 12 to13 years old.
Project Teacher: Elda Scaldarella.

Objectives:

1. To establish a scientific methodology to study the ecology of red corals as a bio-indicator of sea water quality, and to see how the corals influence the balance of the marine ecosystem.
2. To investigate red corals as an economic resource.
3. To explore ways to ensure that economic activities don't endanger valuable environmental resources, and to ensure that these same activities respect the need to protect them.
4. To bridge cultures by increasing students' knowledge of coral and other Mediterranean sea organisms, and to raise awareness of our common marine ecosystem.

Funds:
The project was supported by school funding from extra-curricular activities.

RESULTS AND EVALUATION OF THE INITIATIVE

1. Increased scientific knowledge, especially in relation to coral biology.
2. Awareness of the effects of over-exploitation, excessive maritime transport and local pollution.
3. Appreciation of coral handicrafts, the craftsman's skills and the need to protect this valuable / precious expertise as a manifestation of cultural heritage.
4. Awareness of the importance of coral in the local economy and of job prospects in the the coral industry.
5. The production of a book by the students presenting their findings, which was distributed to the community.

The project contributed towards making the students aware of:
- The enormous value of their environmental inheritance.
- The prudent use of the natural and cultural resources of their region, avoiding any over-exploitation.

How the initiative served to implement the theme of SEMEP for 2010-2011, "Bridging Cultures through Science for a Sustainable Environment"

The initiative was a good example of an investigation linking science and culture, thus fulfilling the aims of SEMEP 2010-2011. The initiative involved various classes (of students), different disciplines, favoured teachers' collaboration and stimulated cooperative learning in a synergistic way. We believe that the project was an example of good practice because the students were fascinated by the topic from the outset. They worked with genuine enthusiasm and were motivated to acquire knowledge about an issue that is of great importance for their local environment. In the course of their investigations the students also dealt with many different topics. They gained insights into the myths surrounding the collection of coral, the history and traditions associated with the industry, the biology and types of precious coral, red coral fishing and the different stages involved in the processing of coral. Finally, the students visited the coral-rich Torre del Greco region and the coral city known as "Oromare".

Official Corallo Torre del Greco stamp

The following is an extract from the students' concluding report:

"Although red coral has been over-exploited for many years, it isn't yet an endangered species in the strictest sense. There are large coastal populations that still breed well, some of them in protected marine areas such as the archipelago of Medes in Spain, the Tuscan Archipelago, Portofino and Capo Caccia in Italy. Many populations of commercial importance, especially deep lying ones, have been heavily exploited, especially in Sardinia. Furthermore, the low growth rate of the coral makes it a species that is not easily managed. Consequently, it is necessary to develop research studies, especially on deep coral reefs, in order to obtain reliable estimates of the demographic parameters and genetic structure of populations, thus allowing for the rational management of this precious Mediterranean species".

Students in the laboratories

SEMEP activities in Italy

1. Organisation of the 'Environmental Education Week' for the year 1998 and 1999 in Genoa.
2. Organisation of SEMEP National Coordinators Meeting in Genoa in 2000 and 2004.
3. The results of the SEMEP project "Discover your city: Marcianise" have been made into a book; the teacher Elda Scaldarella, coordinator of the work, was awarded the 7th Mediterranean Honorific Award by MEDITERRANIA ONES on the 1st of June 2007 in Tarragona. Other works have been published in International Education Research Reviews.
4. Much valuable material produced by SEMEP schools was presented during the annual conference of European Education Research Association (EERA) in 2006 and 2008.

National Coordinator of Italy

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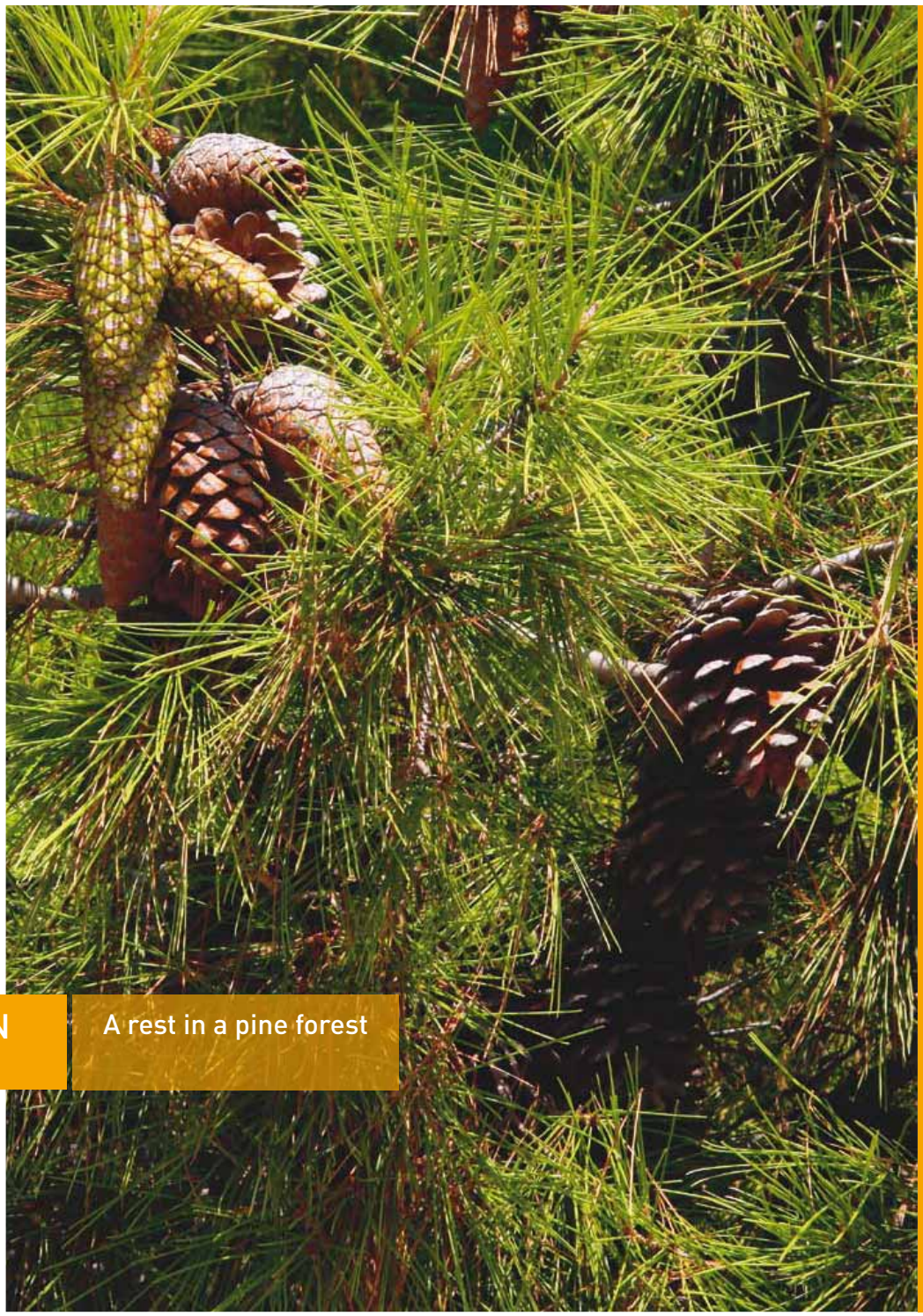

JORDAN

A rest in a pine forest

JORDAN

A rest in a pine forest

INITIATIVE DESCRIPTION IN BRIEF

This project represents a step forward in promoting awareness of the various uses of pine forests over and above their role as sites for Eco-tourism. It is widely agreed that gymnosperms can solve many environmental problems, such as desertification, pollution and soil erosion.

In this project, geography, biology and computer science were integrated with art to give the students the chance to view the subject in a holistic way.

First, the students learned about desertification in Jordan and subsequently the students explored the biology of pine forest ecosystems. Then a questionnaire was designed to enhance knowledge about desertification and the economic parameters of the pine forest.

Furthermore, the local community was involved in various projects which included:

1. Art projects using pine cones and raw materials from the forest.

2. Lectures delivered by professors from the Department of Agriculture.

3. An interview with the Director of the Department of Forests and Forestry in Irbid.

4. A tree planting campaign at our Directorate of education in Bani Kenana Irbid.

Teaching outdoors

Who was involved:
Ministry of Education of Jordan
Directorate of Education / Bani Kenana
Hareema Secondary School for Girls
Teacher: Sawsan Al Hourani
Tenth grade and eleventh grade secondary school students
Members of the local community
Local government institutions

Objectives:

1. To evaluate desertification in Jordan.
2. To research the importance of pines.
3. To take responsibility for raising awareness of the importance of the planting and maintenance of conifers.
4. To apply skills for research on the internet and for using computer programs. such as Mind Mapper, Moviemaker, PowerPoint, Publisher and Survey.
5. To establish and foster communication skills.

Teaching outdoors

RESULTS AND EVALUATION OF THE INITIATIVE

1. Lecture:

   This lecture, which was held in Hareema secondary school for girls and delivered by an agricultural engineer, introduced the students to the characteristics of different types of conifers, and illustrated their adaptations in the Jordanian environment.

2. Drawing a poster:

   The student team designed a poster for the project.

3. Planting and trimming pine trees:

   This video presents school students planting pine trees and shows the implementation of the campaign to trim pines in the school garden as part of the services provided by the project for enhancing the local environment.

4. Pine art work:

   We organized an art exhibition in the school to show students' creative work inspired by the pine forests and utilizing physical features of the actual trees.

How the initiative served to implement the theme of SEMEP for 2010-2011, "Bridging Cultures through Science for a Sustainable Environment"

This project is in line with global environmental issues, and adopts new teaching strategies to encourage students to gather data and analyse it for the purpose of solving the problems facing their society. This project succeeded in enhancing the awareness of students of environmental issues affecting their region. It also developed their sense of belonging to their country by helping to solve environmental problems in a way which would affect all members of their community positively. This project also complemented the fact that 2011 was the "National year of the forests" in Jordan.

SEMEP provides the opportunity to assist and deliver support to teachers, and to stimulate students to work by providing them with the suitable learning environment for developing those educational skills that are not usually promoted in the official curriculum. Thus SEMEP is a very important educational project, which has had a profound impact on both students and teachers in the whole Mediterranean region in the field of education for sustainable development.

SEMEP ctivities in Jordan

1. The Department of curricula has started to develop an Environmental Education Guidebook in order to provide school teachers and students with an assortment of activities on different environmental issues.
2. In cooperation with the Royal Society for the Conservation of Nature (RSCN), the Ministry of Education is now running a program "Water Efficiency Project" to be integrated in school curricula. This project aims to developing educational material on topics related to the water issues in Jordan (lack of water, water pollution, water management).

National Coordinator of Jordan

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THE PALESTINIAN AUTHORITY

Ethics and environmentally friendly schools

THE PALESTINIAN AUTHORITY

Ethics and environmentally friendly schools

INITIATIVE DESCRIPTION IN BRIEF

The initiative was implemented in a school located in Ramallah in Palestine. The population of Ramallah city is increasing rapidly and this places great pressure on local natural resources. Hence the establishing of an eco-friendly school with an emphasis on environmental ethics is an undertaking of great importance for Ramallah students.

Name of School: Ramallah Girls' Secondary Public School.
Age of students: The students who participated were 15 to 16 years old, from the tenth and eleven grades.
Project coordinator: The project was supervised by field health coordinators, the school health committee teachers, and the school's principal. The project was supported by the Ministry of Education and Higher Education and Ramallah municipality.

Objectives:

1. To increase green areas in the school by planting wild and endemic plants.
2. To produce traditional gifts through reducing, recycling and reusing solid waste.
3. To promote voluntary work to keep the forests clean and to investigate biodiversity.
4. To investigate environmental ethics and global warming.
5. To provide healthy, traditional breakfasts using natural resources.
6. To establish an environmental SEMEP club.

Funds:
The project was funded entirely from school resources. Students and teachers have worked on the project outside normal school hours.

Palestinian SEMEP Students Planting a School Garden

RESULTS AND EVALUATION OF THE INITIATIVE

1. Establishing an Irrigation network that uses waste water for irrigating the school garden.
2. Enhancing students' knowledge of biodiversity, and environmental ethics.
3. Raising awareness of concerns relating to Palestine's environment in order to appreciate and protect it.
4. Knowledge.
   The school principal made the following statement: "As a result of their participation in the SEMEP project our students were motivated to clean the school garden and the campus in general, and have produced innovative and artistic ways of recycling waste".

Palestinian SEMEP Students
Planting a School Garden

The SEMEP students used the proverbial phrase "leave things as you would like to find them" to encourage other students to take a more responsible approach towards their immediate surroundings and to work on raising awareness of environmental ethics. To this end a SEMEP environmental club was established in the school. Also, field work that took place in a natural forest was highly effective in teaching the students about the scientific methodology of studying biodiversity.

The students genuinely appreciated the interaction between biodiversity and natural resources, and have understood the importance and meaning of cultural heritage. Furthermore, the community, the municipality and the Ministry of Education greatly appreciated the initiative as a whole and acknowledged this with an award presented to the school. The students also became aware of job opportunities in the fields of biodiversity, environment resources and solid waste management.

Finally, the students produced a book on the themes of solid waste, recycling and biodiversity protection, and their campaign was presented to the community. The principal of the school remarked that the students' activities have influenced the local community's awareness of the significance of maintaining biodiversity through good practices.

Analysis of success factors:

The initiative involved a broad range of ages, different disciplines and favoured teacher-student collaboration. It also stimulated cooperative learning. The teachers, students and administration felt highly motivated due to the fact that their project had a UNESCO theme. The future objective is to expand the implementation of the initiative to other schools.

How the initiative served to implement the theme of SEMEP for 2010-2011, "Bridging Cultures through Science for a Sustainable Environment"

The students' investigation linked science and culture through the study of the significance of environmental sciences in their daily lives. They concluded that the development of traditional cultural behaviours that are environmentally- friendly may allow for the development of an environmentally-friendly modern culture which would eventually fulfill the aims of SEMEP.

Poster promoting clean environment
designed by Palestinian SEMEP students

We believe the project was an example of good practice because the students were deeply interested in the project and worked with genuine enthusiasm. In the course of their work they were stimulated to acquire knowledge about environmental ethics and biodiversity. Also, the students' success in establishing an environmentally friendly school is very important for their territory because it ensures sustainability and commitment while adhering to new methods of learning, namely, student-centered methods like those employed throughout the SEMEP initiative.

National Coordinator of the Palestinian Authority

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Environmental officer / School health department
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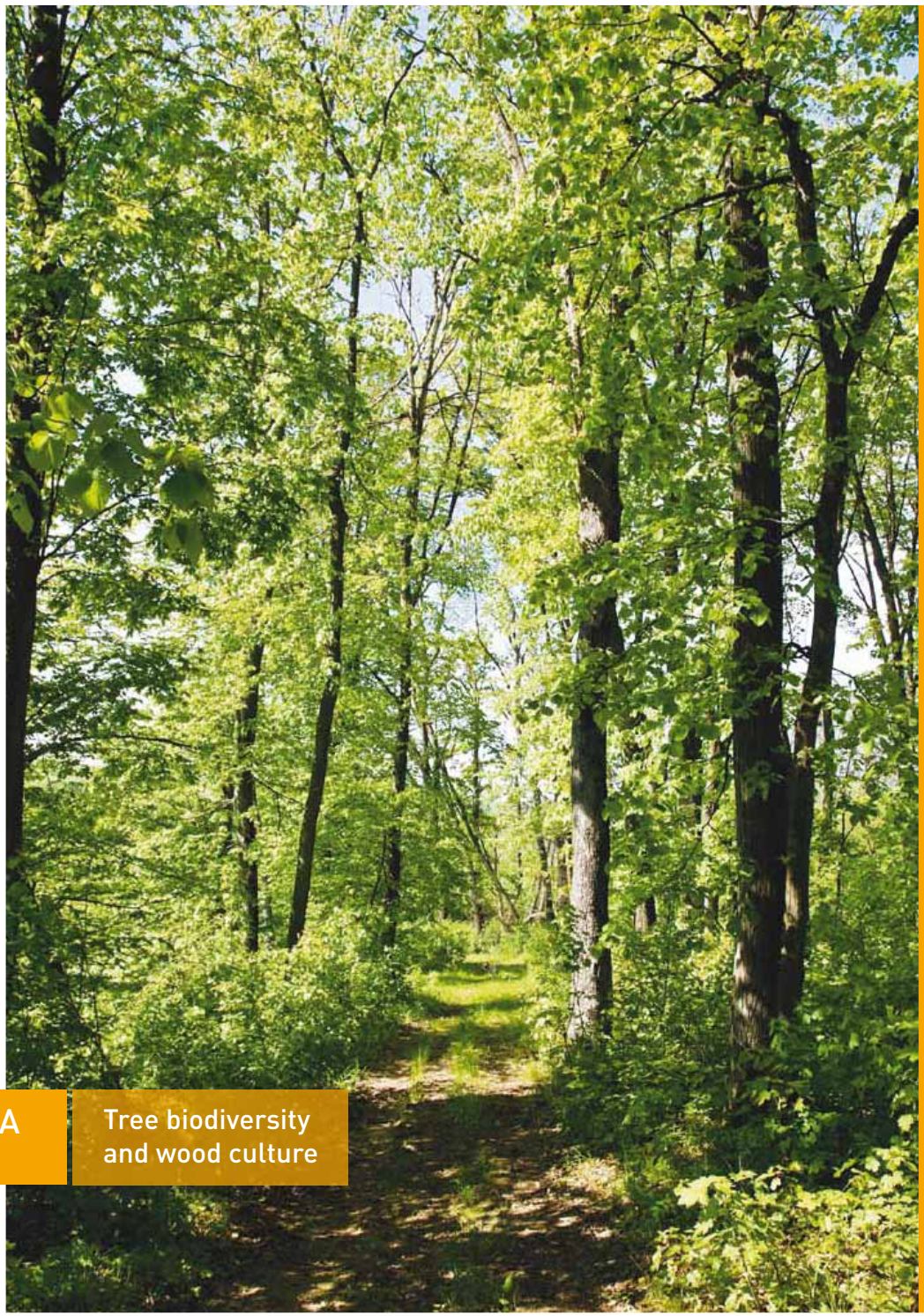

ROMANIA

Tree biodiversity and wood culture

ROMANIA

Tree biodiversity and wood culture

INITIATIVE DESCRIPTION IN BRIEF

The teachers involved in SEMEP chose the theme: "Tree Biodiversity and Wood Culture". This theme has therefore been incorporated in all related subjects studied in schools which follow the national school curriculum. The subjects included are: literature, music, art, history, botanic studies, the sciences (biology, physics, chemistry and technology) and also architecture, religion, sports, and hygiene. An opening ceremony for this program took place in Bucharest at a UNESCO school, where students presented both the logo for the International Year of the Forest and also a written "testimony" on man's influence on biodiversity, climate change and the protection of forests and wildlife. These are all themes that promote the message for the school year 2011-"Trees and forests are vital to human survival".

Objectives:

1. To provide guidance to teachers and students on how the use of scientific methodology can lead to enhanced awareness and understanding of the common historical, social, cultural, ecological and ethical heritage of tree biodiversity in order to promote a culture of peace and tolerance.
2. To promote team work, involving the collaboration of as many students as possible, of different ages and backgrounds, with teacher coordinators taking responsibility for the supervision and coordination of activities.
3. To emphasize and encourage creativity and innovation, as well as the mixing of theory with practical skills and themed outings (for example: creating school materials and supplies out of wood, visiting museums and libraries, organizing field trips).

RESULTS AND EVALUATION OF THE INITIATIVE

Each educational institution (ranging from kindergartens to high schools) chose the subject approach to be implemented in relation to the aforementioned topic, and at the final stage of the program presented their findings to the other schools involved in the program.

Kindergartens

The pre-school students learned to distinguish the various shapes and forms of each tree, fruit and leaf. In October and November they looked at and studied the trees that bear fruit in autumn, (apples, pears, prunes, hazelnuts, etc).

These students also learned how certain products are made, such as various jams, juices and even furniture, ranging from common chairs or tables to expertly made violins. They investigated the cultural significance of trees and frequently asked questions like " How do fruits and trees survive in nature?".

To learn about a healthy diet, the pre-school children were encouraged to create images of small animals composed of fruit, in an attempt to emphasize in an amusing and memorable way the importance of eating fresh fruit. An exhibition of these decorative arrangements made out of fruits and also vegetables was presented at the Romanian Ministry of Agriculture by the creators - the kindergarten children involved in the project - and also the group of school children that were 6 to 10 years old. Parents, teachers and other representatives of governmental institutions, including high ranking representatives of the Ministry also had the opportunity to participate in and

become familiar with the project outcomes. Hand-made decorations for Christmas trees were also presented by the children, who were later able to take their "school work" back home to the family.

The program on this theme continues. For example, all the kindergarten children have been keeping track of "their" trees, watching them bloom, grow their first leaves, first flowers and the first fruit, in expectation of that "most important moment of all" ... when the fruits are ripe for picking.

Primary school. 6 to 10 year old children.

The 6 to 10 year old children learned about the significance of the Christmas tree as part of the broader Christian tradition, and also about its special importance for the Romanian people. This entailed highlighting the moments in Romanian life when the tree is used as part of custom and as a symbol, such as:

1. When houses are built, the tree is placed on the roof top in the belief that it will ensure prosperity, durability and other favourable conditions.
2. When young couples marry, the tree is decorated in an ostentatious way and remains present at the wedding ceremony, again as a sign of long lasting life.
3. When branches from the Christmas tree are attached to the house gates or the doors of young couples who have just got engaged.

Gymnasium. (11 to 15 year old students) - Topic: "Trees in music. Trees in History"

Trees in History:
In this thematic area three topics relating to Romanian history and legend were explored:
- "The tree is man's brother". This Romanian saying sprung from a custom which had its origins in antiquity and which lasted up to medieval times, when peasants and those without means of self-defense fled to the forest-covered highlands, in order to hide from invading or migrating tribes and nations.
- The personality and life of the Romanian mid-15th century ruler Stephen the Great, to whom the legend is attached concerning "his Borzesti oak tree". This is a popular historical topic, present even today in the educational curriculum.

- The great Romanian historian, writer and philosopher Nicolae Iorga who, with only two days left to live, left for posterity "The legend of the Christmas tree", in which he compared his life and work to the evergreen tree.

Trees in music :

As a small sample of the vast contribution of trees as an inspiration for the creation of music and poetry, performances were given during the opening ceremony of Antonio Vivaldi's "Autumn" and Franz Schubert's "Oak Tree". There were also recitals of forest-themed poems, culminating in a rendition of "Oh Christmas Tree", possibly the most famous carol of all time.

Trees in literature:

In folk and popular poetry, novels, stories and cult fairy tales by established writers, trees are a recurrent theme. They feature regularly in the great works of Romania's national poet, Eminescu. "My first book", the title of an educational program in its 5th Edition, focuses on books and libraries, with the tree present both physically (in the forms of paper and book shelves), and also as a literary theme.

Trees in the arts. Trees in painting.

From paper to charcoal tipped wooden pencils, brushes and other wooden utensils, natural colours made from leaves and fruits, all these items derived from trees were present in the works of the children participating in the "Windows open to the sky" painting and drawing competition. This thematic section involved field trips to convents and monasteries in the vicinity of Bucharest, where students could observe not only religious art, but also religious craftsmanship and especially woodwork in the form of crosses, icons, and as a feature of interior designs. They even

The Danube river pelicans.
Where do they build their nests?

saw churches made entirely from wood (for which Romania is famous). The children came to appreciate that the tree was the key element in the creation of all these objects and artefacts.

High school (15 to 19 year old students).

High school students focused on science and technology, thus the various usages of wood in transportation - water, land and air - was their chosen topic.

Transportation on water

The students examined the whole range of water transport from wooden log rafts on which

passengers stood up and pushed using long wooden poles on the river bed, to traditional fishing boats (many still in use) in the Danube Delta or on the Danube itself, to wooden ships and sailing boats, and then to the luxury cruise ships that utilize wood as a decorative element.

Transportation on land
The students came to appreciate the evolution of this type of transport from the wooden wheel to animal drawn carriages and the sleds used during winter to transport lumber or other materials. They also looked at the smaller sleds used by children for recreational purposes all the way up to the modern day usage of wood as a luxury decoration in interior car design

Wood has also been used on a large scale in aircraft design and manufacture, as the very first model aeroplane was made out of wood. Among the forerunners in aircraft design was the Romanian engineer Aurel Vlaicu, who almost one hundred years ago flew his own wooden aircraft across Romania, with the same engine used by the Wright brothers.

Railway transportation is another field in which wood was and still is a highly important element - the freight trains of old were all made out of wood, the very first passenger coaches were made entirely out of it, culminating in the creation of trains like the luxurious Orient Express, still considered to be a masterpiece of passenger train design.

Neither did we forget the fact that wood was for a long time the basic fuel that powered the entire world industry, that was used as a fuel at people's homes and, in some cases, formed the home in itself.

Wood in sports
Much of the apparatus and equipment used in sport historically was made out of wood, before it was gradually replaced by other synthetic materials. In some sports, such as golf for instance, wood is still in use to the same degree as before.

Wood in schools
Within schools, wood has been widely used in various forms either for pencils, paper books and notebooks, for benches and seats, workshop tools and teaching instruments. In painting, music and sports, to name but a few, wood has had various educational uses.

Romania wetlands of the Danube river

Analysis of success factors:

A special theme was addressed by the students from Reghin, whose student group comprised children from kindergarten to high school (3 to 19 years old). Their chosen project, "Trees that sing", was based on "forest music", which involved examining the sounds of the forest during storms or rain, and seeing how the forest provided a range of instruments, from popular folk instruments, like whistles, to the most valuable and sophisticated of musical instruments, the violins. Their work also included a visit to the highly celebrated Reghin Violin Factory, one of the most famous in Europe. This chosen topic called for a multi-disciplinary approach that allowed for the involvement of all the teachers in one school, as well as the students, all of whom had the opportunity to experience team work and the joy and satisfaction of creating, while also taking part in curricular and extra-curricular activities. The chosen theme is vast, complex and fascinating because it relates to all, young and old, regardless of background.

SEMEP activities in Romania

The 17th National Coordinators meeting, which took place in the Danube Delta Biosphere reserve, Romania from the 14th to the 17th of June 2012, with the support of Veolia, Apa Nova from Bucharest, focused on biodiversity and the sustainability of the Danube Delta.

National Coordinator of Romania

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SLOVENIA

Utilising trees throughout time

SLOVENIA

Utilising trees throughout time

INITIATIVE DESCRIPTION IN BRIEF

Slovenian SEMEP schools collaborated with institutions such as Škocjan Park Caves (Man and Biosphere) and elementary schools in a joint activity, to carry out an interesting overview of tree species in the Primorska area. The relevance of the project was enhanced by the fact that it occurred during the International Year of Biodiversity. The SEMEP high school, Gimnazija Koper, has integrated cultural components and science in order to raise the quality of learning and to establish the basis for continuous development and collaboration.

The following elementary schools assisted in the above project:
- Podgora, Kuteževo
- Dragotina Keteja, Ilirska Bistrica
- Dr. Bogomirja Magajne, Divača
- Antona Žnideršiča, Ilirska Bistrica

The mentors are mostly teachers of science, social studies and art, elementary school teachers and kindergarden teachers.

Objectives:

1. To teach the scientific methodology for tree taxonomy (classification).
2. To raise public awareness as to the importance of biodiversity for the environment and the community.
3. To understand the biodiversity of tree species in the past and compare this with the present biodiversity of trees in the area of Primorska.
4. To acquire knowledge in the fields of botany and ecology.
5. To grasp the connection/relationship between natural and cultural heritage.
6. To establish links between scientific research approaches and pedagogical theory.
7. To establish valid connections between science and society.

Tree observation in the Strunjan Landscape Park

Funds:
The project was supported by Slovenia National Commission of UNESCO and the participating schools.

RESULTS AND EVALUATION OF THE INITIATIVE

Students interviewed their grandparents, parents and neighbours to find out about the various legends, stories and anecdotes associated with different types of trees in relation to local culture and tradition. As part of the project the students completed questionnaires in order to collect/ diverse facts relating to the flowering, the size, the classification, the fruit and the uses of this fruit, and other parts of specific trees. Students from each school presented their results on the 12 November 2011, at Prem Castle.

Analysis of success factors:

The following extract is taken from a student's diary:
"Today we visited Strunjan Landscape Park. Although the nature around us was really beautiful, we - the girls, were more preoccupied with the mud which was spoiling our white and silver shoes. There were too many mosquitoes buzzing around us, and sometimes we were hot, sometimes we were cold, and the hills we had to climb were too high/steep. But despite everything we had a great time. We took pictures of trees, flowers, animals, the sea and cliffs. Finally, after a long walk, we had an ice cream on the coast and waited for a taxi to take us back to school. We were impressed that our findings were published on the following web page:
http://www.biodiverziteta-bok.si

Book "Pearls of the Mediterranean" and ecological poster of Albania.

How the initiative served to implement the theme of SEMEP for 2010-2011, "Bridging Cultures through Science for a Sustainable Environment"

1. The Škocjan Park Caves scientists provided the questionnaire and gave instructions on how to collect data to the mentors and the students.
2. An analysis of the questionnaires and fieldwork reports was completed by the scientists of Škocjan Park Caves.
3. Students from each school produced a presentation, a poster, and/or a production of a short film to highlight the scientific methodology for tree taxonomy and show how this integrates with the culture and everyday life.
4. The presentation of the project and the results are available on web page: http://www.biodiverziteta-bok.si
5. The project was also presented during the National Coordinators' meeting in Cyprus.

SEMEP activities in Slovenia

Slovenia has been an active participant of SEMEP since 1997. Slovenian students and teachers participated in the 1st Summer school, which was held in Thessaloniki, Greece from 2 to 10 August 1997.

Over this period we have been present at all SEMEP National Coordinators' meetings, teachers' seminars and other common activities.

Notable prrojects:

1. The International Workshop entitled "Promoting Environmental Awareness and the Importance of Protecting the Adriatic Sea for Future Generations" (2001).
2. The International Exhibition and Workshop entitled "Ecological Posters" (2002) focusing on the actual problems facing our planet, such as pollution of air and water, waste disposal and the protection of biodiversity.
3. The SEMEP Calendar entitled "The SEMEP countries" (2006) with pictures and photographs produced by students from Albania, Bulgaria, Croatia, Cyprus, Egypt, Greece, Israel, Italy, Malta, Romania, Slovenia and Turkey.
4. The SEMEP book entitled "Pearls of the Mediterranean" (2007) tales and legends written by students from schools participating in SEMEP.
5. The National Coordinators annual SEMEP meeting (2009) covering the theme "Rapprochement of Culture, Biodiversity, Ecology, Health and History Through Science".

National Coordinator of Slovenia

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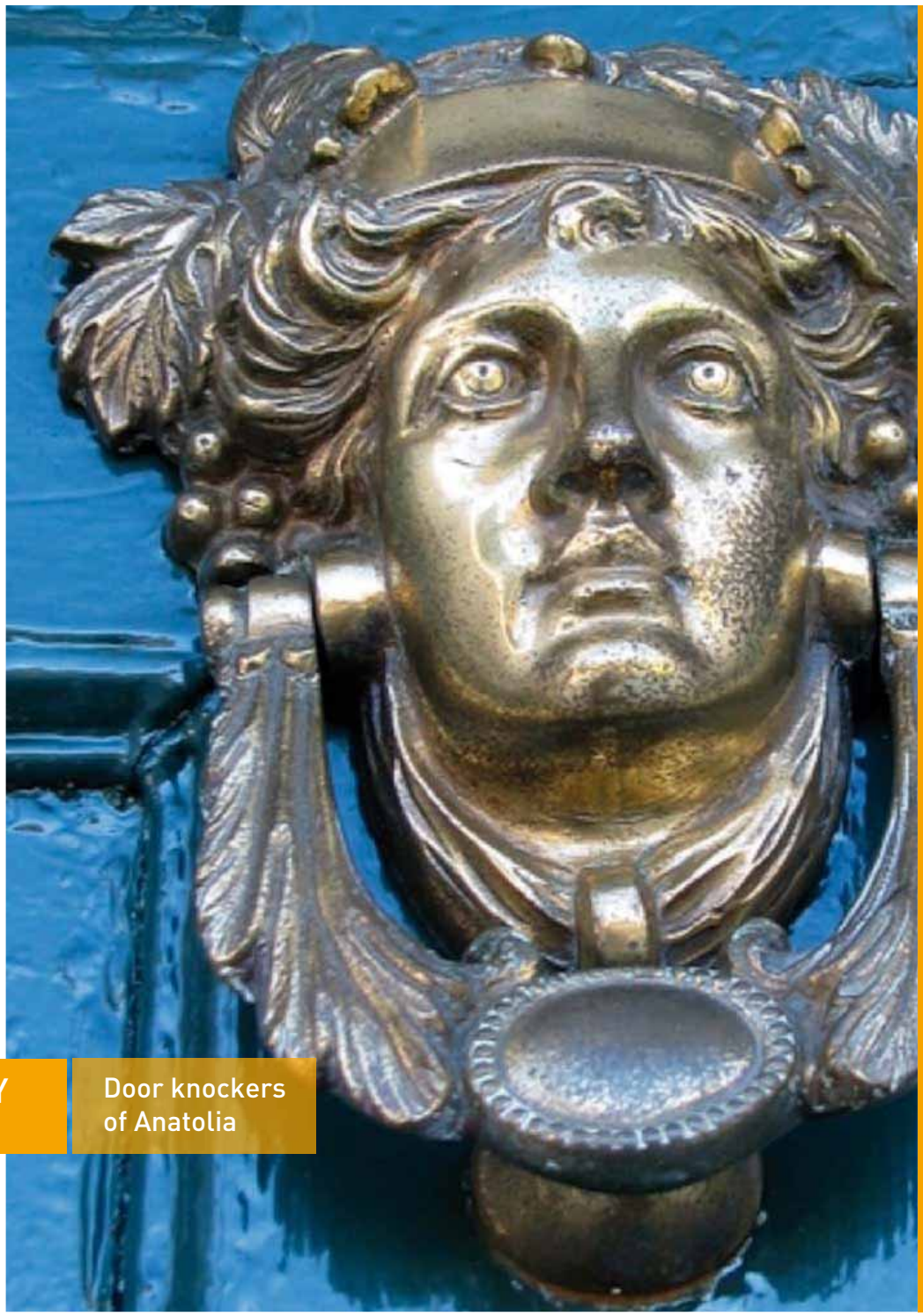

TURKEY

Door knockers of Anatolia

TURKEY

Door knockers of Anatolia

INITIATIVE DESCRIPTION IN BRIEF

Door knockers are used as a means to alert the home occupants that somebody is outside their door. Traditionally brass door knockers have also been added to many front doors in an effort to provide a decorative element that is aesthetically pleasing.

The Evolution of Door Knockers
Little is written about the history of door knockers and certainly no one individual can be credited for their invention. They have certainly been used for over two thousand years with early examples found in ancient Macedonia from around 400BC. Only elite members of society would have been able to afford these early examples as their price must have been considerable due to the tools and techniques then available.

Our students' mission was:

1. To examine the variety of features characteristic of door knockers in Anatolia / Turkey, which has been home to diverse civilizations over the centuries.
2. To become familiar with the various cultures that have influenced door knocker features and production.

Our School is the Hayrullah Kefoğlu Anatolian High School.
Teachers: Hülya Aslan Öztürk, Sevgi Yaşar, Sevim Deni.

Objectives:

1. To establish a scientific methodology for door knocker classification based on colour, shape, size and culture.
2. To spread knowledge and understanding regarding cultural heritage.
3. To bridge cultures through comparison with other Mediterranean door knockers.
4. To raise awareness relating to the protection of old Mediterranean door knockers.

RESULTS AND EVALUATION OF THE INITIATIVE

Figures used in door knockers and their meanings:

Lion: strength, power
Eagle: the spirit that protects one's power
Dragon: war against darkness and evil
Snake : protection from evil spirits
Scorpion: protection from evil spirits
Bird: power, homesickness
Ox: the unity of the family
Hand: abundance, marital status
Pomegranate or Opium Poppy: abundance
Tulip: prosperity
Sun: brightness, light, improvement
Moon: darkness, dark powers
A woman's head: innocence, the personality of the host

Door knocker manufacturing techniques

These techniques can be divided into two: forging and casting. The forging technique is known as a transformation technique in which hot metal is forged on an anvil. This particular technique is time consuming.The casting technique, on the other hand, entails the cooling of molten metal which has been cast in a mould. This technique is more easily applied. In particular, door knockers that have been made of bronze are rich in decoration and strikingly bright in colour. There are a number of decorating techniques common to Turkish metal crafts that are employed in the making of these knockers, such as carving (kazıma), relief (kabartma), filigree (telkari işi), inlay (kakma), and gilding (yaldız).

Door knockers from the Aegean region

Here brass and iron castings were most commonly used. Figures of plants, birds (pigeons mostly), lions, sea shells, fish, people and children were also used as door knockers. In the case of hand-shaped figures, the curves on wrists were carefully drawn. In this region, the influence of Greek culture is quite visible. For this reason, most of the knocker figures in the Aegean region are totally different from the figures in other regions.

The door knockers from the Mediterranean region

In this region, nearly all knockers were made by using the casting technique. Most of the examples have the simple, ordinary ring design. Also, there are some L shaped figures which were made by using the scraping technique.The figures of tulips, garlands and the female head were used on these particular knockers. As shown in the list above, the image of a woman's head indicated the innocence and the personality of the host.

Throughout the 14th and 15th centuries knockers with rings, which belong to the period of the Seljuk Empire, were popular, but in the 16th and 17th centuries the number of Gregorian motif door knockers increased.

The door knockers from the Central Anatolian region

Here door knockers were made in different shapes and also produced by using the embossment and scraping techniques which are defining features of Turkish metal art. Most of the figures used on these knockers are representations of eagles, birds, dragons, gorgons, human heads and plants. After the acceptance of Islam, the number of animal and human figures diminished and people started to use chiefly geometrical shapes. In this region, we can see the influence of many cultures, however the influence of the Muslim civilizations is the predominant one.

The door knockers from the South-Eastern Anatolian region

Iron and bronze are the raw materials that have been used for the production of door knockers in this region. In the Islamic world of the middle ages, the figure of a dragon was used on door knockers. It was believed to be a guardian protecting the house and its inhabitants from all kinds of danger. This figure originates from central Asian and Chinese art. Subsequently, it appeared in Sassanid Iskit and Hun arts, and it also featured in the Turkish calendar as one of the 12 animals represented in it. Finally, the influence of Anatolian Seljuk civilizations was predominant in the design of door knockers of this region.

The door knockers from the East Anatolian region

The majority of door knockers from this region of Turkey were cast in brass.The designs that have been used in this region generally feature wild and exotic animals. The ones most frequently used are the snake and the scorpion. It was believed that once a person used such knockers in order to enter a dwelling, then the devil and other evil spirits could not enter that house. In reference to the possible origin of snake and scorpion images, East Anatolia has been influenced by Hittite and Urartu civilizations, which were themselves influenced by the Indian civilization. Each of these ancient cultures considered these creatures to be sacred.

Social findings related to door knockers

- Door knockers can be illustrative of the economic status of their owners. While rich people's door knockers are heavily-made, ornate and brassy, the door knockers of the impoverished are mostly thinly-made of plain ironwork and with rings.
- They can even provide a hint as to the sex of a guest. If the sound of a big knocker is heard within, the visitor is probably a male; if the sound comes from the small knocker, the guest is more likely to be female. Many doors had both a female and a male door knocker hand. Visitors were supposed to use the correct gender hand to knock so that people knew if it was a man or a woman at the door. If it was a man knocking, then a woman (presumably Muslim) wasn't allowed to open the door. If a female was knocking then a Muslim woman could answer the door.
- They also can provide a hint as to the degree of intimacy between guest and host. Strangers used a different door knocker to the one used by friends and relatives.
- They can be illustrative of the marital status of the dwellers within. If the knocker

is hand-shaped and ringless, the dweller is single. If the knocker-hand wears a ring, the person living in that house is married.
- They can provide information relating to the beliefs of the people living in a certain house. Animal and plant shapes, human figures and representations of mythological gods were mainly used before the acceptance of Islam, after which geometric shapes became more commonly used.

Cultures which influenced the art of door knockers
- Shamanism in the Eastern and South-Eastern Anatolian Regions.
- Ancient Greek culture in the Aegean and Mediterranean Regions.
- European culture in the Marmara Region.
- Caucasian culture in the Black Sea Region.
- In the Central Anatolian Region, the effects of all cultures are evident because it was at the crossroads of numerous civilizations.

Today dial-phones, visual screens, door bells with melodies, remote controls, card systems and sound-sensitive door locks are used to enable homes to be entered and dwellers to be alerted to visitors, but none of these can convey the subtle messages of the door knockers of the past or compete with their decorative appeal.

How the initiative served to implement the theme of SEMEP for 2010-2011, "Bridging Cultures through Science for a Sustainable Environment"

With this project we raised pupils' awareness of our cultural heritage and its significance. The students were very interested in creating a classification key for door knockers and worked with great enthusiasm. Our conclusion is that this initiative should also be implemented in other countries in the Mediterranean region.

National Coordinator of Turkey

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Additional photos:

Parent Géry (p. 29).

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