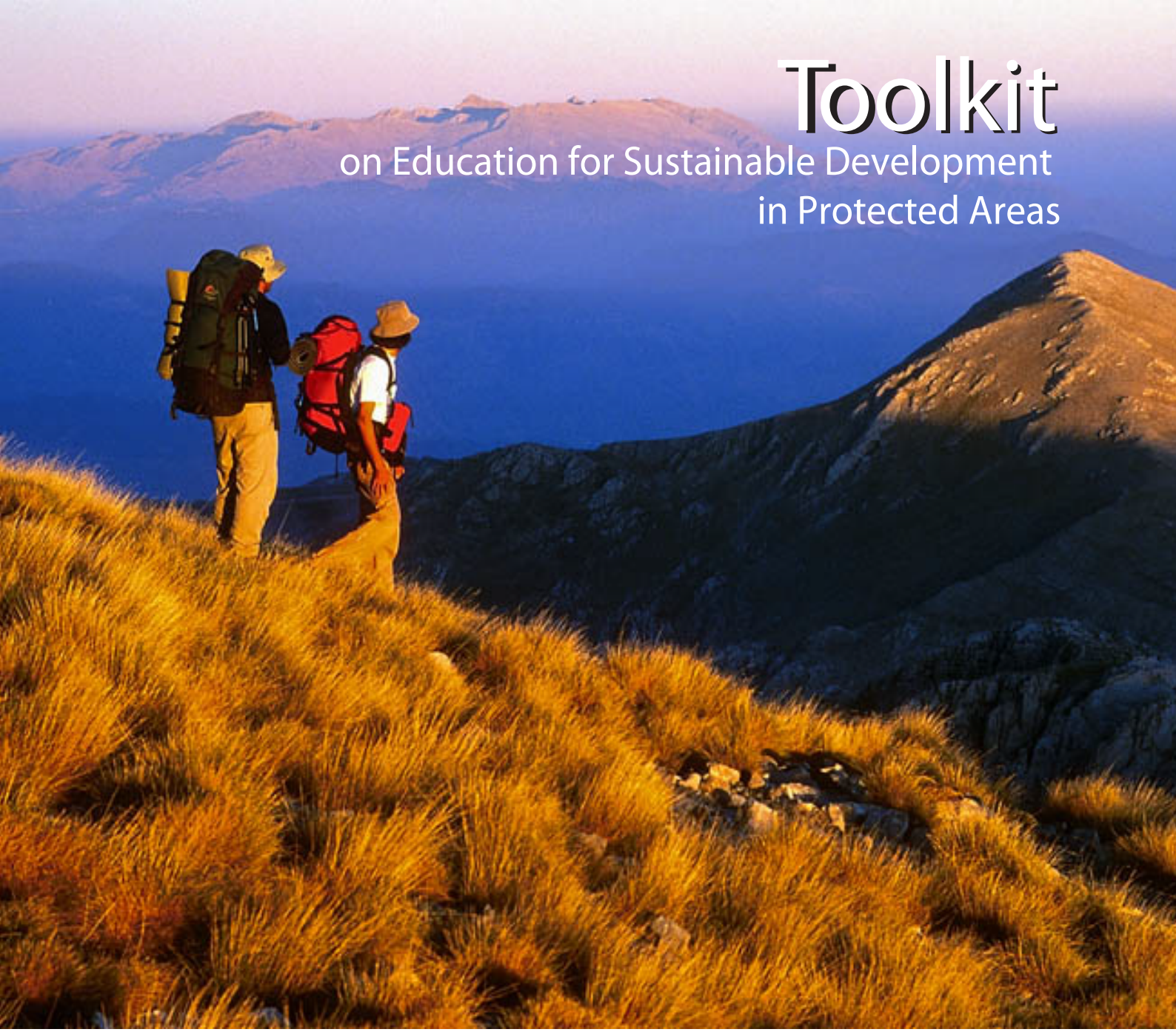

Toolkit

on Education for Sustainable Development in Protected Areas

Erasmus Intensive Programme (IP)

6-19 July 2014, Amfissa,

Grant agreement reference number: [2013-1-GR1-ERA10-15364]

IKY

Lifelong Learning Programme

HELLENIC REPUBLIC
National and Kapodistrian University of Athens

UNESCO Chair in Sustainable Development Management and Education in the Mediterranean
HELLENIC REPUBLIC
National and Kapodistrian University of Athens

Venice Office
Regional Bureau for Science and Culture in Europe
United Nations Educational, Scientific and Cultural Organization

under the auspices

Hellenic National Commission for UNESCO
United Nations Educational, Scientific and Cultural Organization

Greek National Committee MAB

Mediterranean Information Office for Environment, Culture

Mediterranean Education Initiative for Environment and

Akdeniz University

Frederick University

Technical University of Catalunia

University of Padova

University of Primorska

University of Zagreb

Technical University of Bordeaux

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Parnassus Mountain
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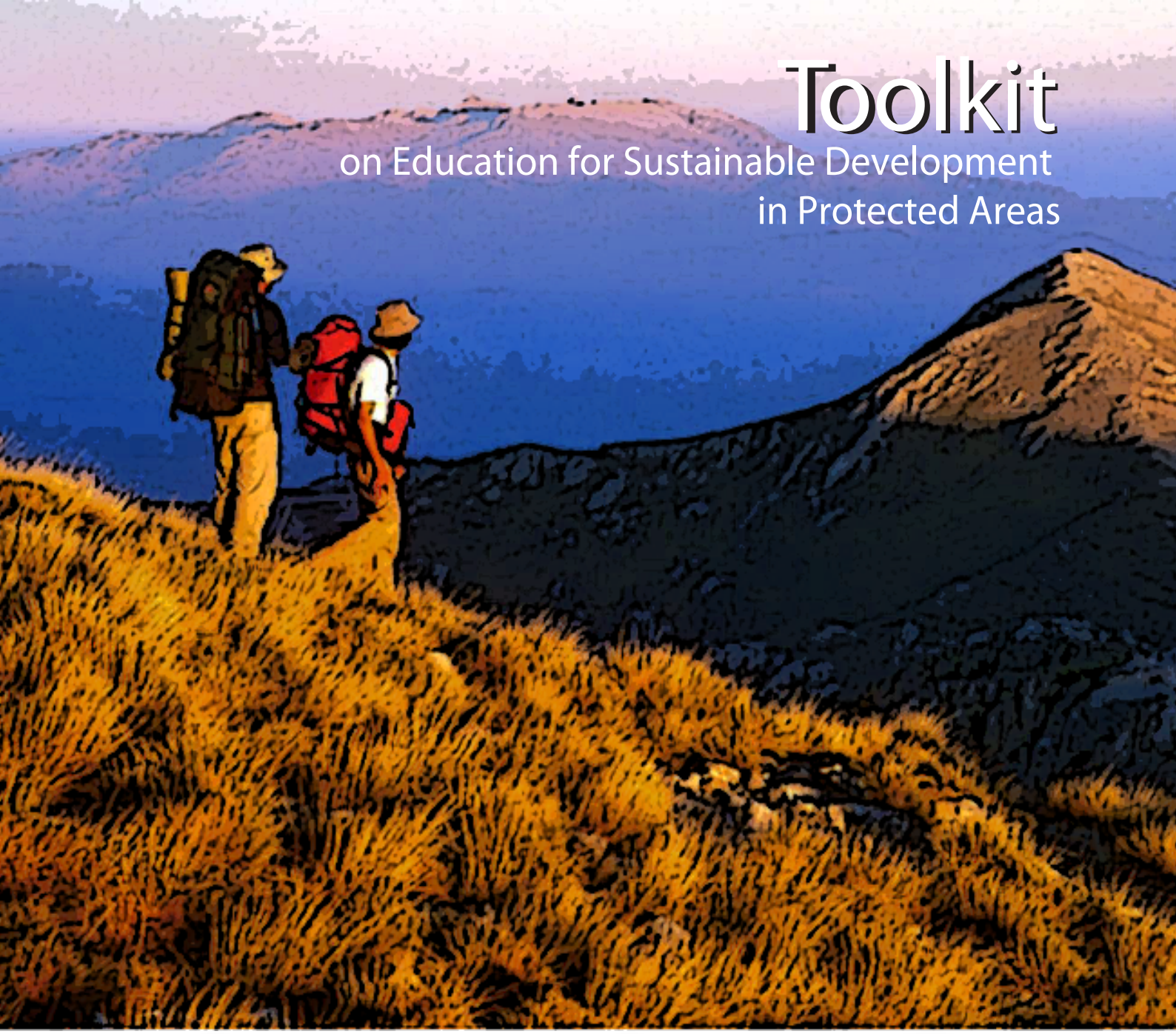

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Athens 2014

ΙΔΡΥΜΑ ΚΡΑΤΙΚΩΝ ΥΠΟΤΡΟΦΙΩΝ IKY

Lifelong Learning Programme

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Technical University of Catalunia
University of Padova
University of Primorska
University of Zagreb
Technical University of Bordeaux
Amfissas Environmental Education Center

Introduction

by Prof. Michael Scoullos
Director of Environmental Chemistry Laboratory,
Faculty of Chemistry
UNESCO Chair & Network on Sustainable Development
Management and Education in the Mediterranean
National and Kapodistrian University of Athens
Chairman MAB Greece, MIO-ECSDE /MEDIES, GWP-Med

This toolkit is the result of the collective effort and hard work of the professors /educators who participated in the design and implementation of the **Erasmus Intensive Program on Education for Sustainable Development in Protected Areas**, which took place in July 2014 in Amfissa /Delphi, Greece, with the participation of eight Universities belonging to the *Network of Mediterranean Universities for Sustainable Development, with emphasis on Education for Sustainable Development*, under the coordination of the University of Athens, in particular its *UNESCO Chair on Sustainable Development Management and Education in the Mediterranean*. It brings together experience of decades of teaching and research combined with state of the art information and methodologies on Environmental Education, ESD and management of Biosphere Reserves and protected areas, while it reflects upon and elaborates further on specific chapters of our homonymous book jointly published by UNESCO /Venice Office and MIO-ECSDE.

The 14-days Summer School addressed Post-gradual students and experts actively involved with BRs, and was held in the premisses of the Amfissa's Environmental Education Centre. Apart from sharing knowledge and experience based on "good practices" but also on challenges, the course confirmed that protected/specially designated areas and especially UNESCO /MAB Biosphere Reserves as "*learning laboratories*", ideal for applying ESD .

Participating students were divided in eight groups and worked having heard the content of the toolkit, under the guidance of different educators while they also communicated with residents, scientists and staff of protected areas and relevant institutions interviewing them as part of their training to collect information for their work. Therefore this toolkit reflects also the multicultural nature and spirit of the issues and solutions for sustainable development that participants have shared throughout this summer school.

We hope that the expertise offered will become widely disseminated and used by professors BR managers and post graduate students in the Euro-Mediterranean region and beyond, worldwide.

I would like to sincerely thank all those who have contributed enthusiastically to the success of this Summer School and the overall programme.

Prof. Michael Scoullos

The participating 8 Universities were members of the wider "**Network of the Mediterranean Universities for Sustainable Development (SD) focusing on Education for Sustainable Development"** including the :

University of Athens (Greece) Coordinator: **Prof. Michael Scoullos** (Leader)

Frederick University (Cyprus) Coordinator: **Dr. Marios Andreou**

University of Zagreb (Croatia) Coordinator: **Prof. Natalia Koprivanac /Prof. Dinko Vujevic**

Technical University of Bordeaux (France) Coordinator: **Prof. Michel Ricard**

University of Padova (Italy) Coordinator: **Prof. Michele Biasutti**

University of Primorska (Slovenia) Coordinator: **Prof. Roberto Biloslavo**

Technical University of Catalunia (Spain) Coordinator: **Prof. Antoni Grau**

Akdeniz University (Turkey) Coordinator: **Prof. Tuncay Neyisci**

Associated Partners:

MIO-ECSDE / MEdIES: **MSc Vassilis Psallidas**

Centre of Environmental Education of Amfissa: **Dr. Michael Theocharopoulos, MSc Georgios Kottis and Dr. Ekaterini Mandroni**

The project is co-organised and has the support of the UNESCO Regional Bureau for Science and Culture in Europe, Venice (Italy): **Philippe Pypaert, Helene Gille**

all of them were the trainers of the Summer School.

Secretariat: **Katerina Paschalidou, Olga Papathanasopoulou**

The summer School was under the auspicies of the Hellenic National Comission for UNESCO

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The course ultimately promoted designated areas and especially UNESCO/ MAB Biosphere Reserves as "***learning laboratories***", ideal for applying education for sustainable development.

The course was based, to a large extend, on the UNESCO/ MIO-ECSDE/UoA publication entitled "***Education for Sustainable Development in Biospheres Reserves and other Designated Areas: A Resource Book for Educators in South-Eastern Europe and the Mediterranean"*** (http://unesdoc.unesco.org/images/0021/002199/219946e.pdf) that has been developed in 2012 as a training material for ESD experts and trainers. The Summer school was based on the main ESD principles and methods including critical thinking, participatory processes, interdisciplinary and systemic approaches, as well as skill development and enhancement.

Each session included 3 parts:
(i) a type of introductory - formative activity to elicit students' knowledge and skills on the session's topic;
(ii) the basic theoretical presentation/lecture;
(iii) the implementation activity (workshop) during which the students applied the new knowledge i.e. issue analysis, problem solving exercises, future scenarios, case studies, etc.

Furthermore, the school included sessions devoted to **field work** and the use of **ICT**. Participants progress was evaluated frequently, using various tools (short questionnaires, games, peer-evaluation, a reviewing exercise, etc.), securing adequate feedback.

The participants were clustered in eight (8) working groups; each one of them undertook the preparation and presentation of an essay. The **essay** themes included "Organisation of a Center of ESD in a BR or other designated area", "Water management in the area of Phocis Prefecture and Parnassos National Park", "The fire risks in the area of Parnassos National Park" and "ESD approach through agricultural production and related practices at the Park of Parnassos and the surrounding area". On the last day of the school, students participated in an evaluation session where they had the opportunity to reflect on the Summer School in its totality. ICT tools were also used to evaluate the Erasmus+ course.

The course was concluded with a **declaration** prepared by the trainees to be delivered to the International Conferences: on ESD in Nagoya (November 2014) and on Water, Seventh World Water Forum (Korea, April 2015) and the Ceremony for the student's diplomas and the certificates of the other trainers.

Students were assigned various tasks (short essays); formed eight (8) essay working groups. Students chose their subjects themselves, among the ones proposed by teachers through guided discussion. These studies were mainly aimed to exploit the knowledge gained during the summer school and to familiarize them in ESD research including: research objectives, formulating questions, designing research, collecting the necessary data and information through field work/personal observations, interviews utilizing ICT (web pages, e-applications, etc.). The students were guided to prepare their essays presenting their data, discussing and commenting them. Throughout the course, students had the opportunity to approach relevant literature particularly through internet. The supervising professors assisted them in their research by discussing with them and even by helping them to structure their essays.

The given indicative structure of the short essays for ESD programmes /interventions was the following:
• Introduction analyzing the scope of the work, its objectives and intended outputs.
• Methodology used, including observations, interviews, literature review, etc.
• Results of the work and relevant discussion.
• Conclusions and recommendations.

The Essay Working Groups:
The participant students formed eight (8) essay working groups (EWG) dealing with the following list of the themes:

1. Building up an ESD Centre on the Island of Samothrace, Greece (pdf, ppt).
2. Public participation and stakeholder involvement in promoting the management of the Amazon Forest Area in Leticia (CO) - (pdf, ppt).
3. Fire risk at Parnassus National Park (PNP) and its management (pdf, ppt).
4. The effectiveness of Education on peoples on sustainability though the medium of agricultural products and related practices from the Park of Parnassos and the surrounding area (pdf, ppt).
5. Setting up an ESD centre for a protected area: objectives; prerequisites and tools (pdf, ppt).
6. Setting up an ESD center in the village of Leon_France (pdf, ppt).
7. Education centers for sustainable development and local participation (pdf, ppt).
8. Water management in the area of Phocis prefecture and Parnassus National Park (pdf, ppt).

Each EWG delivered by an essay written in the DOC form and a presentation on a ppt file. So each EWG presented its work in the plenary, using four slides, one per each part of the work (Contents, Introduction, Methodology of Research, Results, Recommendations and Conclusion). The presentations were delivered by all the members of the group in sequence during the last three days of the summer school. The trainers evaluated the content and quality of presentations/power points.

Lana Švab, B.A. Tourism Management, Slovenia
Mirjana Novak, M.Sc Chemistry, Croatia
Remziye Ekici, B.A. Tourism Management, Turkey
Mary Pitiakoudi, Sustainable Samothraki NGO, Greece

Keywords: education for sustainable development, biosphere reserve, bottom-up approach, sustainable farming

1. Introduction

The island of Samothraki is situated at the North-eastern point of the Aegean Sea. It is a mountainous island of v lcanic origin with a total surface area of 178 km² and the highest peak up rising to 1.611 m.

The island has been inhabited since prehistoric times as proven by the numerous sites dating back to 6000 BC. From the 5th century BC until 400 AD, Samothraki was famed as a spiritual centre devoted to the worship of the Great Gods and Kaveiria Mysteries. The famous Nike of Samothrace that is exhibited in the museum of Louvre was found in the "Sanctuary of the Great Gods" in Palaiopoli.

Nowadays the Samothraki Island has 2.840 inhabitants (2011 census) and the population triples during the summer season due to the tourism activity. In fact the island is visited by about 27.000 mostly domestic tourists per year which contributes to an important part of the GDP of the island and engages as much as 40 % of it´s workforce, whereas the other 45 % of the population works in the primary sector which is highly above the Greek average of 12,5 %. The income of the farmers is depended on EU Agricultural subsidies based on the Common Agricultural Policy (CAP) mostly in the livestock sector. This policy has led to the high increase of the livestock population which is one of the main issues of the island which contradict with the existing Natura 2000 protected area that covers more than two thirds of the island´s surface and marine area.

Picture 1

The idea of transforming Samothraki to a Biosphere Reserve started as a bottom up process and initiated by a regular visitor of the island until it was gradually transmitted to the local stakeholders. A Biosphere reserve is an internationally recognized area within the framework of UNESCO's Programme on Man and the Biosphere (MAB), established in order to promote and demonstrate a balanced relationship between humans and the biosphere. Several steps were taken in order to

obtain the Biosphere Reserve status of the Samothraki Island among which the feasibility research based on interviews with locals, surveys and focus groups; preparation for the application to Unesco by the research team in collaboration with local stakeholders, the mayor and the municipal council, however the first application was submitted and refused due to the unclear management plan of the island. The second application was submitted in 2013.

As a preparation for the MAB programme, an Education for Sustainable Development Centre has to be established on the island in order to pass the new way of thinking and acting to the local community and find ways to solve or at least minimize the human related ecological issues of the island. The process is a step by step one and it requests from the local community to be ready to face the economical, environmental and social changes. New skills and new practices have to be obtained and learned by the community in order to respond to the challenges of the present and the future. Our mission is to create such an ESD centre that will be able to help supporting the growth and evolution of the island as a whole. Knowledge is the strong base upon which a new vision can be build and education can transform our reality.

Apart from the literature review which presents the theoretical base for this paper, we studied a number of case studies, e.g. examples of good practices around the world to be able to extract the findings and apply them to the case of the island of Samothraki, Greece.

2. Methodology

As a part of our work methods we conducted several team meetings and we had brainstorming sessions about the information and knowledge obtained from classes related to sustainable development, the tools and methods on setting up an ESD centre and knowledge based on our personal experience on the topic. After that we identified the key words on which we wanted to work on and split the sections based on our background and skills on which we worked individually for an agreed period of time by using the literature review.

In the second step of our research path we interviewed Dr Biologist Despoina Mertzanidou, responsible for the Awareness, Education and Publicity sector of the management body of Parnassos National Park and she gave us her insight and ideas in order to help us build our vision.

Pictures 2 & 3

As a part of our research we also conducted several case studies of good practices listed below in order to apply the knowledge and experience obtained from other similar projects to the case of Samothraki ESD centre.

From a case study on **ESD in Urdaibai Biosphere Reserve at Basque Autonomous country, Spain** (Scoullus, Kouroutos, Mantazara, Alampei, Malotidi, Psallidas, 2013, 110) we learned the importance of coordination between ESD programmes and the local environment programmes, meaning the local community, social partners and other stakeholders have to be included in the implementation of the Samothraki ESD Centre activities. The ESD centre in Urdabai has the capacity and training centers for teacher and schools under their government coordination in order to coordinate the ESD programmes. Their aim is a close coordination between the ESD programmes and the local environment programmes and they cover a wide range of themes related to energy, education or cultural heritages.

Another good example is an environmental education center in Czech Republic, Kladno. **The Kladno Environmental Education Centre** is a low-energy building, equipped by a solar water heating system and wood pellet boilers. Environmentally responsible and natural construction materials were incorporated into the project and the building provides a healthy indoor environment for occupants. The centre also has a rain water harvesting system, green roofing and a wastewater treatment that serves neighbouring buildings. During construction, they used the building to raise awareness of low-energy buildings and environmentally responsible construction materials. Nevertheless the centre takes charitable donations from their partners, the Láznovský nature reserve and a Rescue centre for injured animals (Source: http://www.skanska-sustainability-case-studies.com/Case-Studies/Kladno-Environmental-Education-Center-Czech-Republic.html. Data accessed: 11/07/2014.)

The Regional Environmental Centre for Central and Eastern Europe (REC) is an international organization implementing sustainable development projects, including education and capacity-building programs. The Green Pack, REC's flagship program on education for sustainable development, is a multimedia environmental educational kit for schoolchildren between the ages of 11 and 15 years in Central and Eastern Europe. Since 2001, the Green Pack has been introduced in 18 countries in the Western Balkans, Europe, and Asia, and approximately 30,000 teachers and more than 3 million students have been educated, changing the way in which the teaching of sustainability is approached (Source: http://www.rec.org/topicarea.php?id=6. Data Accessed: 11/07/2014).

ESD Case Study for HEA ICS Subject Centre proves an established practice involving sustainability considerations embedded into the information systems curriculum by the School of Information Systems, at the University of the West of England, Bristol. Students work in small teams on practical IS consultancy projects hosted by external organisations, usually in the local community and voluntary sector. In general, students are taught a responsible approach to long-term holistic thinking in IS practice, which puts human endeavour at the centre of attention, and takes a critical view of the solutions-focused techno-centric approach that dominates the industry, and that (arguably) leads to the large-scale failures in systems projects that continue.

(Source: http://webcache.googleusercontent.com/search?q=cache:HN7-1ThfmqgJ:www.ics.heacademy.ac.uk/resources/supp_learning/esd/Case_Studies/Nick%2520Plant.doc+&cd=1&hl=el&ct=clnk. Data Accessed: 11/07/2014)

The Toohey Forest Environmental Education Centre (TFEEC) is a Department of Education, Training and Employment facility located in the sustainably designed Griffith University EcoCentre. The facility is surrounded by the natural backdrop of Toohey Forest. And the centre provides a range of day visit programs to students about themes including Australian flora and fauna / Biodiversity / Ecology, Health / Water Quality Monitoring Sustainability / Energy / Waste and Human Impact Studies.

(Source: http://www.toohforeeec.eq.edu.au/about-us/. Data Accessed: 14/07/2014)

3. Research

Tha Samothraki Island as an ecosystem

The mountain range of Samothraki Island has a north orientation where a wet microclimate exists. Numerous streams are coming down from the mountain forming hundreds of waterfalls and freshwater pools whereas the oriental plane trees reach down to the beaches. The southern and western sides are typically Mediterranean in terms of climate, vegetation and agricultural use. A large part of the south side does not have a road access therefore the only way to get there is either by the sea or by foot. There is a rich biodiversity due to the specific climatic and geographic characteristics of the ecosystem as well as they are various terrestrial and marine habitats which accommodate different plant and animal species. There are eight endemic species on the region and the last remaining old growth forests among the Aegean islands (Martini Forest). Except of the numerous springs, streams and rivers there are are also thermal water springs due to the tectonic trenches.


Picture 4

In 2001 about two thirds of the Samothraki´s surface was proclaimed a *Natura 2000* conservation area by the Greek government and was recently extended by a large marine area.

The current issues of the island

The most precious features of the island mentioned above are threatened due to the sharp increase in the number of goats and sheep (the overgrazing effect) due to the EU´s financial stimulations for agriculture, resulting in severe erosion. Additionally

also overfishing, inadequate water and waste management and uncontrolled deforestation to meet the rising demands on firewood and inadequate infrastructures represent a problem (Fischer-Kowalski, Xenidis, Jit Singh and Pallua, 2011, 181). The extensive overgrazing due to a huge number of goats and sheep as well as the other issues of the island are dividing the local community and disturb the social, environmental and economic balance of the island. There are also some conflicts between the livestock owners and other stakeholders which result in the perceived lack of cooperation and trust between the stakeholders that needs to be bridged. There is an increased need of strategic management of the natural resources and infrastructures as it is of greatest significance the cultivation of synergy. In order to organize a new management and be scientifically supported in times of crisis the municipality and local stakeholders choose to explore the possibility to adopt the Man and Biosphere programme.

The population of the Samothraki Island

The current population of Samothraki is measured at 2.840 inhabitants (2011 census) and triples during the summer season. The average number of people working in the primary sector is reaching 45% and is very high in comparison with the Greek average of around 12.5%. The income of the farmers is depended on EU Agricultural subsidies based on the Common Agricultural Policy (CAP) mostly in the livestock sector. This policy has led to the high increase of the livestock population. The Secondary Sector is employing 12% and consists mainly of a creamery, a winery, a wheat mill, some construction activity that has became very limited due the the economical crisis. The 40% of the workforce on the tertiary sector is engaged in tourism. The population consists of two polarised groups. On one side there is group of less educated middle-aged males mostly working in the primary sector. On the other side a group of younger more educated residents working mostly in the service sector.


Picture 5

The increase of population of the Samothraki Island in the summer triples due to the tourism. Many island´s natural features, natural sites and geological and physiographical formations, are interesting from touristic point of you. Those features are: Thermal spring at Therma; A number of waterfalls suitable for the development of canyoing and other water sports and a number of endemic species and a Martini forrest mentioned in the previous chapter. In fact the island is visited by about 27.000 tourists a year which are for the most part domestic tourists. Due to the remote

geographical position of the island and lack of island´s own airport, the tourism on the island has escaped mass tourism yet the attached tourist population is an important asset for the island. Some of the efforts to limit the number of tourists in the peak season and increase the funds for the preservation of the island include the idea of introducing a conservation fee in the ammount of 2 € to charge the visitors of the island. The results of a recent survey showed the 90% of the visitors are willing to pay the suggested fee in order to help funding the preservation of the island and reported an interest in repeated visit of the island.

The shared local community vision of sustainability

According to Fischer-Kowalski et al. (2011, 181) several focus groups and semi structured interviews were conducted with local stakeholders (fishermen, farmers, local professionals, school- and kindergarten teachers, elderly and others) and the analysis of the results showed that ˝the local non-governmental organizations (NGOs) criticized the authorities' policies and demand effective strategies to conserve the island's ecosystems˝. According to that, the authors suggest a bottom-up solution, which would help develop the island of Samothraki in a sustainable way, according to the community´s shared vision and as a valuable heritage and asset. Such solution can only be implemented if supported by the local population who needs to anticipate benefits in order to minimize the negative trade-offs. A biophysical and socio-economic assessment of the Island Samothraki show that establishing a biosphere reserve (the term biosphere reserve originates from UNESCO's *Man and the Biosphere Programme)* on the island would represent a pathway of both nature conservation and socio-economic benefits and be welcomed by the majority of stakeholders so the community council recently endorsed an application to UNESCO.

ESD centres vs. EE centres

Apart from existing Natura 2000 area and recent efforts to proclaim the island a biosphere reserve we suggest to the stakeholders and local NGO´s to build an ESD centre which would help establishing the better conditions for a sustainable development of the island. According to Scoulos et al. (2013, 107) the ESD centres represent an upgrade of EE which "narrowly focuses on environmental protection, natural resource management and conservation of nature" as they bring the socio-economic, political and cultural dimensions into the whole picture considering the environment as a "component of development (ibid., 108)". By doing so the ESD centres try to contribute to the long-term prosperity of local community in a holistic, systemic way yet not only improve awareness of the protection of the environment.

Samothraki ESD centre´s vision

The vision of an ESD centre in Samothraki would be an interactive multidimensional educational centre with an aim to apply the sustainability theories to all of its processes in order to act, think and teach in the holistic way.

The centre would use many of already existing infrastructure that the municipality of Samothraki owns yet aren't in use or misused. The ESD centre would be therefore set with the smallest possible investment on structure and rather big investment on employing the human resources (educators, guides, organizing personnel) instead.

The new school that already exists in Kamariotissa, for example, has enough space for hosting an ESD centre and can be remodeled in order to add a scientific laboratory, PC room, conference hall, theater, rooms for artistic work-shops and outdoor space for gardening to the existing infrastructure.

ESD´s main activities

Main activities of the Samothraki ESD centre would be: sustainability related education for local farmers, children and students, whereas the ESD would also add education for the visitors of the Island of Samothraki to its curriculum after the system is well established, e.g. after 2 years from establishment of the centre.


Picture 6

The education for local farmers would include themed work-shops on sustainable livestock management, eco-farming, eco-tourism in relation with farming, sustainable methods for harvesting of crops and others. The sustainability education for children would include artistic work-shops inspired by natural cycles, ethics, landscape, traditions and customs as well as the ˝Mini eco drama club˝.

Apart from sustainability related work-shops and lab-analysis for domestic students the ESD Samothraki would propose programmes for students from the abroad universities, partners of local university. Fischer-Kowalski (2013) proposes an excellent example of such educational programme for a group of students from various universities on an excursion to Samothraki, with the aim to learn and apply social ecology approaches in a local setting while building synergy with an on-going UNESCO Man and Biosphere process.

Promotion of student´s participation and new sustainable career opportunities

As a part of the teaching curricula for the students, the ESD centre would also promote the students´ participation at competitions about sustainability and responsibility and the sustainable Job and Career Opportunities. RecycleMania is an example of a friendly competition among college and university recycling programs in the United States that provides the campus community with a fun, proactive activity in waste reduction. Over a 10-week period, campuses compete in different contests to see which institution can collect the largest amount of recyclables per capita, the largest amount of total recyclables, the least amount of trash per capita, or have the highest recycling rate. The promotion of the sustainable job and career

opportunities would include the presentation of future, jobs that are getting more requested each day: sustainability director, manager or coordinator of protected areas.

The team of experts

The Samothraki ESD center would employ a group of experts consisting of the various professions: a biologist, ecologist, sociologist, economist, holistic trainer and anthropologist. We would also invite volunteers to join us and help at our activities as well as researchers from various universities.

Books and materials used

The Samothraki ESD centre would use books and other material which involve implementing, exercises, quizzes and games about ESD for its activities. There is a very informative example of this subject (Let's Learn a Sustainable Lifestyle with the Earth Charter: Decade of Education for Sustainable Development: 2005-2014) about ESD. Apart from books the ESD Samothraki centre would set up an open laboratory-observatory meeting point for scientists and conferences where the students would be able to conduct analysis and scientific research. During the activities also the awareness paths with informative signing will be used.

Process evaluation

The Samothraki ESD centre would also introduce the life cycle management system, ISO 9001:2011 management system as well as the waste management system in order to operate in the most optimal/sustainable way. The ISO 9001:2011 management system is a quality management system that is used by various organisations in order to function more effectively. It has a strong customer focus and includes top management, process approach and improvement methods in order to obtain various benefits from the business.

Picture 7

Supporting institutions and existing projects

The ESD of Samothraki is going to partner with and learn from the following existing institutions and projects:

- The association for the advancement of sustainability in higher education **(AASHE)**.

It is a "membership-based association of colleges and universities working to advance sustainability in higher education in the US and Canada." Their website includes a campus sustainability professional page, classroom resources, publications, interest groups, and a sustainability policy link. They also offer a free, weekly e-newsletter covering campus sustainability news, events, and opportunities. Its goal is to promote sustainability in every area of higher education from governance and operations to curriculum and student-life. And their knowledge teaching method is Learn it - Live it! It is an interactive learning quiz and helps disseminate knowledge in a fun and engaging way.

(Source:http://www.sustainablecampus.cornell.edu/initiatives/association-for-the-advancement-of-sustainability-in-higher-education. Data Accessed: 11/07/2014)

- Campaigns in the context of Sustainability system.

Foundation for Environmental Education Latvia has started a new Eco-Schools public campaign “Responsible Lifestyle”. The campaign consists of a variety of initiatives to provide information and education through long-term oriented activities, as well as ensure direct involvement of the public in activities that are aimed to inspire by action and examples. The campaign will help to make the connection between our everyday life and our impact on the environment.

(Source: http://www.eco-schools.org/service-menu/news/activities--the-best-way-to-benefit-the-environment. Data accessed: 11/07/2014)

- Universities and institutions

The Universities and institutions such as Brown University, California State Polytechnic University, Georgia Institute of Technology and The New Jersey Sustainable Schools Network and Biodiversity Education are implementing the ESD system in their education life and we can learn from their findings.

(Source:http://www.brown.edu/Departments/Brown_Is_Green/, http://www.csupomona.edu/~crs/, http://www.pomona.edu/administration/outdoor-education, http://www.istd.gatech.edu/, http://www.globallearningnj.org/, World Resources Institute (WRI) Education Center http://www.wri.org/wri/enved/. Data accessed: 11/07/2014)

- National Wildlife Federation (NWF) program - “The Campus Ecology”

It is a conservation initiative in higher education that aims to transform the nation's college campuses into living models of a sustainable society. "Greening the Campus" looks beyond the creation of new academic departments and programs for campus

greening to include information on efforts aimed at ensuring that every student - regardless of major - graduates with a greater awareness of environmental issues and their importance. These initiatives often include "environmental audits" that examine the use of resources and the environmental impacts of university operations in solid waste, water, energy, and transportation.

- Medical students and university research projects

Medical students in universities (Bristol University, Imperial College London, University of Cambridge and School of Medicine Health Policy & Practice, UEA, Norwich) have gained important knowledge by learning about climate change and health, Global Environment and Human Health through ESD programmes. Students choosing Global Health have modules on climate change as part of the course. Teaching is given as with occasional videos or guest presentations.

- Eco-villages, gardens and conservatories

The Beauty Narrative Phipps Conservatory and Botanical Gardensis is an eco-village that is used as an educational centre. It has a mission to inspire and educate all students with the beauty and importance of plants, advance sustainability as well as the human and environmental wellbeing through action and research.

Further implications

Once the ESD centre is well established it would provide the domestic and non-domestic visitors with the following sustainable tourism activities: guided tours to protected area with the instruction on how to walk through protected area; traditions, customs and critical themes related work-shops, photography work-shops, social evenings, concerts of local bands and exhibitions of local artists. The ESD would also help with establishment of the educational and awareness paths suggested by ETHIAGE N°37, 2009 (in Scoullos et al., 92) with informative signing that would connect the points of interest and setting up a tourist information point in the area of the biggest tourist activity in order to increase sustainability awareness of the visitors of the island.

As far as the tourist information centre is concerned, there is an existing old school in the village (traditional architecture) with a huge space outside which could become an informational and educational point for tourists. It is positioned on a strategic point at the beginning of the proposed educational paths where we can inform about the rules and the behaviour on the trails. Within the tourist information point we can also set up an exhibition (present minerals, rocks from the island or the endemic species, photography) and cultural centre in order to increase the participation and feeling of connection between the visitors of the island and the locals.

Funding

The Samothraki ESD centre is planning to fund itself from several sources. Some of the funding are planned to be implemented already at the beginning of the functioning of ESD centre, while the others are planned to be implemented once the centre is well established and incorporated to the local community.

The most important funding sources that will represent a major income to the ESD centre from the establishment onwards are the following: commissions from a small shop run by ESD centre selling local produce and authentic souvenirs; income from leasing out the laboratory and other research facilities, library, tv-room, exhibition space and meeting rooms; a voluntary donations from associations, local companies and individuals (it would be possible to donate on our web-site directly); selling of ESD´s promo-material such as T-shirts, magnets, cups, postcards and fundraising activities, such as selling the Christmas cards on eco-theme made by children from the local community as a part of the education work-shops organized by the ESD itself.

Once the ESD centre is incorporated to the local community, it could serve as a direct link between local community and the visitors of the island and help with the promotion of tourism in the area of Samothraki. The local farmers would be encouraged to transform their core activities into eco-farms in order to provide a sustainable, authentic accommodation to visitors of the island of Samothraki and giving them an opportunity to get an insight of the traditions and customs of local community and feel part of it.

Leaning on the existing tourism infrastructure - a port, hotel (built according to sustainable standards), camping site, shops, medical care facilities, spiritual centre and supporting infrastructure - the ESD plans to help with the establishment of the following sustainable infrastructure: eco-hostel for accommodation of the partner universities students and researchers as a part of the educational excursions to Samothraki and glamping site to cater for the needs of high-end niche green tourists close to the existing camping site. The eco-hostel could be set up the 6 empty buildings owned by the municipality which are situated in the Therma area. For the needs of setting up a glamping site the huge property owned by the municipality can be used as it is close to already existing camping site infrastructure as well as an unique forest ecosystem with the predominant habitat of oriental plane trees. The eco-camp would introduce the new ways of waste-water management in order to contribute to the sustainabile development of the island.


Picture 8

One of the future trends in tourism are green, tailor-made vacations and travellers that are looking for a close contact with nature yet do not want to sacrifice the comfort they are used to. Glamping is a new kind of tourism offer, some kind of glamorous camping, which can be recognized by forms of accommodation built in symbiosis with the nature, using the local and recycled materials, renewable energy and the work of local craftsmen yet are equipped with appliances in order to meet the expectations of high-end travellers. The example of good practice which can be used

as a role-model for building up a sustainable glamping site is a glamping site at Gozdne vile, Bled, Slovenia.

(Source:http://www.sava-hotels-resorts.com/en/accomodations/sava-hoteli-bled/gozdne-vile-glamping/the-gozdne-vile-glamping-huts/,
Data accessed: 12/07/2014)

All of the above activities and features would add value to the existing tourist offer, create additional income and new jobs.

Finally the ESD centre plans to partner with a number of private tourism related businesses operating on the island in order to benefit from the synergic effects of such cooperation.

5. Conclusions

The paper is focusing on the establishment of an ESD centre on the Island of Samothraki, Greece in order to improve the awareness of local people – local farmers, children and students – and managing the future development of the island towards a more sustainable development of the island itself and its community.

As the Island of Samothraki is facing several ecology related issues among which we identified the sharp increase in the number of goats and sheep (the overgrazing effect) due to the EU´s financial stimulations for agriculture, resulting in severe erosion; overfishing; inadequate water and waste management; uncontrolled deforestation to meet the rising demands on firewood and inadequate infrastructures, an ESD centre on the island would be highly recommended as the existing Natura 2000 area is threatened.

The basis of our research were internationally recognized theoretical principles, theories and models such as Unesco´s MAB programme for Biosphere Reserves, Natura 2000 protected areas and tips for planning the ESD centres, educational or awareness paths (in Scoullos et al., 92, ETHIAGE N°37, 2009) as well as internal materials for the presentations to focus groups already conducted with the stakeholders at the island of Samothraki.

After a large case-study of examples of good practice in other countries, we suggested the approaches and materials that could be used by Samothraki ESD centre as the education for sustainable development curriculum for the local community.

The base of sustainable development could only be as solid and stable as the depth of the educational root system. Therefore, our first step can only have as a starting point the commence of a new era for education in the area. By dividing and strategically identifying the small scale changes that we want to apply we can integrate and consequently synthesize gradually a whole new vision. We have founded the funding of the ESD center on producing the wealth needed so as to be able to maneuvre as independently as possible in those crucial times of economical crisis. Additionally it is in our aims to create a cooperation and a link with the formal education and the Ministry of Education.

The approach that we adopt in order to connect with the local community has its foundations on the local valuable knowledge of the specific regional conditions and ancient practices that survived through time. Our objective is to enrich their skills with an updated and organized scientific input that is transmitted in a way they can grasp with the least resistance and most sustainability.

Finally our vision includes the evolutionary possibility to host in the future and ESD summer school as the one that initiated our visioning and invite the professors and new educators to enrich our continuous process.

Finally we suggested some further implications and funding from the tourism in connection to ESD centre which include setting up a network of a tourist information and exhibition centre, eco-farms, a glamping site and an eco-hostel as well as we identified the possible future partnerships with existing private tourism related businesses and other stakeholders.

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Building up an ESD centre on the Island of Samothraki, Greece

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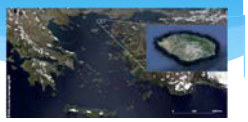
Introduction

- Location : South-eastern Aegean
  Total surface 178 km²
- Cultural heritage :prehistoric times, Temple of the Great Gods
- Natura 2000 protected areas
- Biosphere reserve
- Population : 2840 inhabitants
  40% Tourism 45% Primary sector
- EU subsidies to local farmers
- The current issues of
- Samothraki:
  Social, Economical,Environmental
- The idea of ESD centre



Methodology

- Literature Review
- Team-work & Brainstorming
- Case Studies – Examples of good practices:
  - ESD in Urdaibai Biosphere Reserve at Basque Autonomous Country, Spain
  - Environmental Education Centre in Czech Republic, Kladno
  - The Regional Environmental Centre for Central and Eastern Europe (REC)
  - The Toohey Forest Environmental Education Centre (Department of Griffith University EcoCentre)

Research

- The ESD center's sustainable vision
- Main activities
- Materials used
- Evaluation
- Funding (2 steps)

Conclusions

- Identified ecology related issues
- The ESD centre's potential and main mission
- Educational approach: based on supporting and revealing the knowledge of the local people
- Further implications

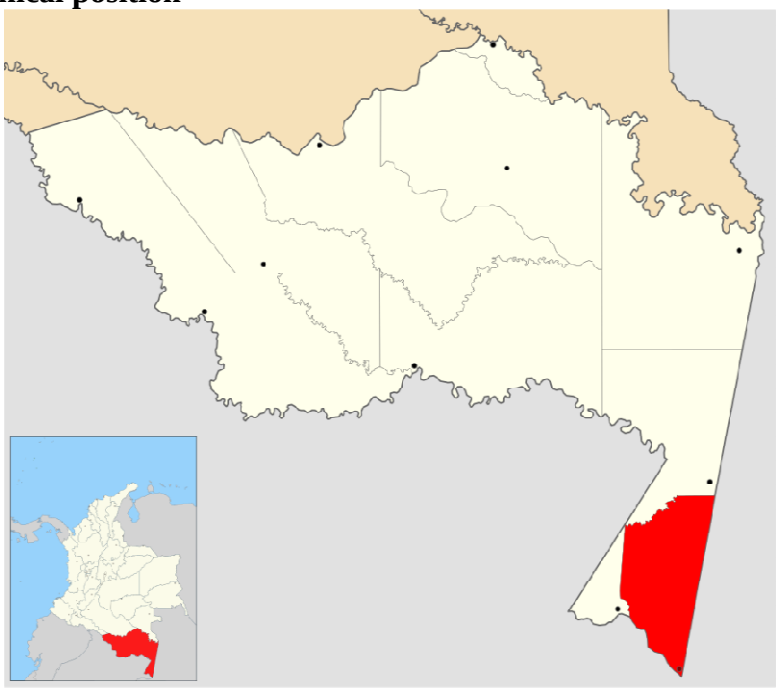
Maria Christakou
Sermin Durdu
Charline Piot
Francesca Eliana Rigato

Contents

Introduction

For this study we took in consideration the Amazon Forest Area in South America Continent, in particular the town of Leticia and the Amacayacu National Natural Park.

1- Geographical position



Picture 1: The geographical position of the town of Leticia

Leticia is the southernmost city in Colombia, it is the capital of the Amazonas department and one of the major ports on the Amazon river and it has approximately 33,000 inhabitants on the left bank of the Amazon river; it is located at the point where Colombia, Brazil and Peru come together in an area called “Tres Fronteras”. There is a tropical rainforest climate and July and August are the only relatively dry months. The wettest period is from February to April. The Rio Amazonas highest level is reached between May and June, while the lowest is from August to October. The difference between low and high water can be as great as 15m.

2- Short history

The Colombian government populate Leticia with people from Bogotá in order to ensure the town's loyalty to Colombia. Most of the people who came from Bogotá from the 1940s to 1965 still live in Leticia. The city's industries have changed a little since then, but agriculture and tourism are still the prime sources of income.In the 1970s, illegal drug trafficking became a new way to make money. During the late 1960s and 1970s narcotic drugs were bought and sold in broad daylight. The drug business was eventually slowed down when a new police force was brought there.

Despite its isolation and often oppressive heat, Leticia is a remarkably little town, with all the services needed by tourists, and a military presence that keeps the region safe. Every person that arrives in Leticia’s airport must pay a US$5 tax.

3- Sustainable tourism

According to the World Tourism Organization, sustainable tourism development requires the informed participation of all relevant stakeholders, as well as strong political leadership to ensure wide participation and consensus building. Achieving sustainable tourism is a continuous process and it requires monitoring of impacts, introducing the necessary preventive and/or corrective measures whenever necessary.

Sustainable tourism should also maintain a high level of tourist satisfaction and ensure a meaningful experience to the tourists, raising their awareness about sustainability issues and promoting sustainable tourism. In an easier way, sustainable tourism can be defined as a kind of tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of the visitors, the industry, the environment and the host communities. Sustainability principles refer to the environmental, economic, and socio-cultural aspects of tourism development, and a suitable balance must be established between these three dimensions to guarantee its long-term sustainability. Thus, sustainable tourism should:

- Make optimal use of environmental resources that constitute a key element in tourism development, maintaining essential ecological processes and helping to conserve natural heritage and biodiversity;
- Respect the socio-cultural authenticity of host communities, conserve their built and living cultural heritage and traditional values, and contribute to inter-cultural understanding and tolerance;
- Ensure viable, long-term economic operations, providing socio-economic benefits to all stakeholders that are fairly distributed, including stable employment and income-earning opportunities and social services to host communities, and contributing to poverty alleviation.

Sustainable tourism development requires the informed participation of all relevant stakeholders, as well as strong political leadership to ensure wide participation and consensus building. Achieving sustainable tourism is a continuous process and it requires constant monitoring of impacts, introducing the necessary preventive and/or corrective measures whenever necessary. Sustainable tourism should also maintain a high level of tourist satisfaction and ensure a meaningful experience to the tourists, raising their awareness about sustainability issues and promoting sustainable tourism practices amongst them.

4- Ecotourism

Ecotourism is a form of sustainable tourism - all forms of tourism can become more sustainable but not all forms of tourism can be ecotourism. "Ecotourism is environmentally responsible travel and visitation to relatively undisturbed natural areas, in order to enjoy, study and appreciate nature (and any accompanying cultural features - both past and present), that promotes conservation, has low visitor impact, and provides for beneficially active socio-economic involvement of local populations".

5- Tourism : Amacayacu Natural Park

To reach Amacayacu National Park, travellers must arrive in Leticia and then embark by boat upriver to the park itself. The park was created in 1975. The park comprises 4,220 square kilometres of jungle, a significant portion of which is annually flooded by the Amazon River during the wet season. The park's elevations vary from 200 to 300 meters above sea level, and temperatures in the park vary from 26 to 28 °C.

As already said, tourism in Leticia has boomed and the town is one of the best tourism destination for foreigners. Leticia can serve as a gateway to further Amazonian experiences. Also the close Tabatinga town in Brazil is worth a visit.

In the park visitors can do different activities such as trips along the Amazon river to different islands like Mico's island where it is possible to find hundreds of monkeys, Mocagua's island where one can see Victoria Regia or the lotus flower and people can also make a trip up the Amazon River to Tarapoto Lake which has dolphins. Several paths through the Amazonas jungle lead to Indian settlements. Another amazing site is Puerto Nariño, the second municipality of the department, to enjoy Amazonian cuisine, which is mainly based on fish and fruit. From Puerto Nariño, visits can be organized to the Tarapoto lakes, a network of dark waters where one can swim with pink and gray dolphins. The park includes accommodation that consists of a Maloka where travellers can sleep with a group of people in hamocs or cabins for 2 to 4 travellers. Here, everybody can enjoy eco-tourism and calm holidays. The park is important also to scientists. Many zoological specimens have been collected in the park.

6- Aims

There are four main aims in this study.
First: to make local products more attractive .
Second: to ensured the public participation and the stakeholder involvment.
Third: to start an education program for sustainable management.
Fourth: to develop new activities based on eco-tourism.

In this area it is very important to operate carefully, as it is one of the most sensitive areas to changes, at an environmental, and economic and social level. It is important to expand and create new activities and opportunities both for local people and for tourists and at the same time maintaining the traditional way of life of the region.

Methodology of Research

Methodology, is by definition, the systematic, theoretical analysis of the methods applied to a field of study. It comprises the theoretical analysis of a combination of methods and principles associated with a range of knowledge. Typically, it encompasses concepts such as paradigm, theoretical model, phases and quantitative or qualitative techniques.

Our research methodology was based on techniques such as the brainstorming; after hearing the subject we were asked to note down any key word that crossed our mind. We selected the place of our interest, Amazon Forest in Leticia, which is located between Colombia, Peru and Brasil, based on the experience of one of the team's members, Francesca Rigato, who has already visited the place, during one of her ecotourism excursions. Our next step was to look on the internet for literature research, so as to gather all the necessary information relevant to the specific area.

The next stage was to use the Strength, Weakness, Opportunities, Threats (SWOT) Analysis Tool. Through this procedure, we took into consideration the strengths and weakness of the area as well as the existing opportunities and the threat points.

We went further and interviewed Prof. Michael Scoullos and Prof. Tuncay Neysci, in order to better comprehend the subject, addressing them the same set of questions.

The questions were related to the structure of our research and the directions towards which we should be working. The two Professors gave us ideas, examples of best practices, and advised us how to connect the material with sustainable development.

For better management, we divided the subject into three parts. For the first part, we ensured the participation of the civil society and the active involvement of all the relevant stakeholders. The second part had to do with promoting the management of the area while the third focused on Education for Sustainable Development (ESD). The above three parts were vital for us in order to comprehend the subject in depth and eventually be able to properly combine them in our essay.

Our team was formulated, in such a way, so that each member would represent a part of the civil society. More specifically, Francesca represented the local people, Maria the stakeholders, Sermin the NGOs and Sharline the relevant authorities so as to approach the issue from different points of view and decide on our recommendations. The results derived from the combination of all the data gathered and are presented herewith.

Results

The results of the different types of analysis will be presented above:

1- Brainstorming

From Brainstorming the keywords were:

- Public participation
- Ecotourism
- Job opportunities

- New products
- Sports
- ESD
- Area (Amazon Forest)
- …

2- SWOT analysis

The results from SWOT analysis:

Strenghts:

- You can easily reach other 2 nationalities by boat
- There is large potential for tourism in this area
- Biodiversity Landscape is suitable for tourism
- There is ample accomodation

Weaknesses:

- Transportation choice (just plane) is not enough for this region/limited accesibility
- Lack of job opportunities
- There is no social activity
- Because of humidity, there are many mosquitos
- The negative effects of extreme temperatures
- Rainforest climate
- Lack of financial support for course
- There isn't enough advertising of local products

Opportunities:

- There is water potential for touristic activities
- Convenient area for undeveloped products
- Ecoproducts are provided from the jungle
- There is a potential to create new job opportunities

Threats:

- Conflict between new activities and local culture might be a problem in the future

Bearing in mind that there are specific weakness and threats in the area, which we cannot easily overcome, and knowing that Amazon Forest is a burning issue, nevertheless, we can take measures and make suggestions for the promotion of sustainable development or this area.

Recommendations and conclusion

1- Development of a future market for fish in the Area

In Latin American countries, with very few exceptions, all fisheries could be considered as being artisanal until the middle of the 20th century. As for semantics, we can therefore say that "artisanal" fishery is largely also a "traditional" fishery.

In order to develop fishing, a cooperative could be developed in the area. For example, in Mexico, there are around 1.650 fishermen cooperatives, known as "Cooperative Societies of Fishery Production", and this kind of society can also help the area to develop itself. The main difference with private companies, however, is the fact that the cooperative is owned by its members who effectively work and produce a common wealth from a common ressource. According to the table 1 below, different products could be sold by a cooperative.

Picture 2: Landing site of the Cooperative in Mexico

Table 1: Presentation of the different products sold by a cooperative

Product	Description/ Presentation	Packaging	Perceived quality
Fresh fish, whole	Diversity of species, washed and stored in plastic boxes with crushed ice	No packaging	Fresh, good flavour, nutritious, affordable prices
Blue crab, whole, crude	Whole, fresh	No packaging	Fresh, good flavour, nutritious, affordable prices
Crab meat	cooked	Nylon bags with 1 Kg.	good flavour, affordable prices
Shrimp	Blue and "coffee" shrimp, stored in plastic boxes with crushed ice	No packaging	Fresh, good flavour, nutritious, affordable prices
Oysters	Shell-on	In 45 Kg bags	Fresh, good flavour, nutritious, affordable prices.
Oysters	Shell-off	bags	iced, good flavour, affordable prices

Different goals and strategies could be developed for this kind of cooperative, as presented in Table 2 below. This case comes from the Cooperative of Tamiahua and can be considered as a successful artisanal fishermen initiative in Latin America and can be used as a good example.

Table 2: Main strategies and goals of the Cooperative of Tamiahua

Strategy	Impact	Actions
		Catches
Modernizing equipments	Improved quality	▪ Develop research activities more related to inland waters, through consulting firms and research centres. ▪ Obtaining financing options for fishermen ▪ Install support activities according to the needs of changes. ▪ Inform the subsequent elements of the distribution chain about the benefits of the changes.
		Processing
Develop processing activities	Add value to the products	▪ Search for financing options for the Cooperative
		Marketing
Better positioning of the product on the regional market	Increase the demand for the product, increase the selling prices, improve the image of the products	▪ Implement market surveys through consulting firms ▪ Implement a publicity campaign in order to inform better the consumers ▪ Establish different levels of association with members of the distribution chain
		Transport
Having more adequate transport unities	Reduce losses, More opportunities of delivery, better quality of the product	▪ Identification of better conservation and transport equipment ▪ Identification of financing possibilities for their acquisition.

Moreover, the creation of this cooperative can contribute to the development of many jobs, such as technicians, engineers, managers, scientists, ecologists. Through this, a new kind of dynamic will be encouraged, and buildings need to be erected.

2- Education For Sustainable Development (ESD)

Sustainable Development appears in the mid-1980s. Its definition is: “development that meets the needs of the present generation without compromising the ability of future generation to meet their own needs”.

In addition to that, ESD considers that the environmental protection, through essential, is not enough; the whole system needs to be protected, given that the environment is component of development. Therefore, every region should be managed in a sustainable way, based on a specific set of criteria.

ESD has to create new patterns towards environment and it should be a lifelong educational dynamic process based on not what to think but how to think.

In that way, education for sustainable development should be established as soon as possible for local students, and the promotion of this education should have a place in primary school, in high school and university. Education for sustainable development at school could be integrated as a project which can be implemented in forest excursions, and should drive awareness on the necessity to keep the area of Leticia as healthy as possible. For university formations, lectures on specific characteristics of the Leticia area, natural ecosystems and management of areas may be offered to students. It could also be designed a bachelor degree thesis specialized in a interdisciplinary process included ESD.

Moreover, it is also essential to focus on adults, and organize a public awareness campaign on sustainable development. Though this, diffusion of knowledge could be achieved in two senses: parents to children, and children to parents (based on the preceding paragraph).

The Amazon Forest appears to be unique and ESD should promote this It would therefore be interesting to develop an educational programme on survival in the tropical forest. Furthermore, this programme could be transmitted from local people to tourists and permit close relationship between both.

3- Ecotourism

In the case of Leticia, we purpose to focus ecotourism on different points:

- Sport ecotourism
- Awareness on local ecoproducts
- Training courses in order to survive in wilderness
- Intangible Services

Concerning the sport ecotourism, we purpose many emergent sports. It is essential that tourists remember their trip in Leticia, and practice activities that they can't do in their country. A couple for examples could be scuba diving and canoeing as you can see on the pictures below.

The Amazon forest is characterised by different kinds of wealth. Plants take part in this richness and can be used as local ecoproducts. For example, plant medicine is more and more known as an alternative to pharmaceuticals. Medicinal plants found in this area are ginger, stevia, nettle, cocaine and many others. The use of these plants as a row material for the production of medicines, such as oil for skeleton, muscles diseases, for mind purification or for many other things can be really attractive to tourists. Moreover, a doctor can be responsible for this new kind of market, in order to have a trusting relationship with tourists.

Also, we can design training courses for tourists to offer some useful guidelines of how to survive in wilderness. On this idea, it could be interesting to transmit the knowledge from local people to tourists. In the same way, raids with guides, for several days, could be suggested to tourists, as a unique experience that it would be unforgettable.

Another recommendation could be Intangible services. For instance, they could be attractive for tourists to be guided and taking pictures of some plants or animals habitants, or just enjoy the moment and keep the memory. For example we can find nymphs (Victoria regia), dolphins (pink and grey dolphins), lamantino, animals you can touch such as sloths, snakes, monkeys and many others.

Finally, the development of Leticia area should be based on the synergy between the different fields presented above. For instance, tourism and agriculture can cooperate in order to promote some local products to the tourists in the hotels and vice versa.

All these parameters are linked in synergy, in other words we should take into account all the aspects presented here together.

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Education for Sustainable Development
in Protected Areas and Biosphere Reserves

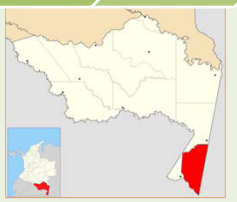
Public participation and stakeholder involvement in promoting the management of the Amazon Forest Area in Leticia (CO).

Maria Christakou
Sermin Durdu
Charline Piot
Francesca Eliana Rigato

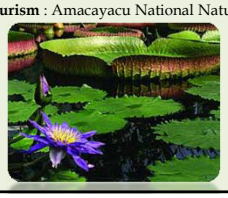
Introduction | Methodology | Results | Conclusion-Recommendations

- Geographical position
- Short history
- Sustainable Tourism & Ecotourism

"Tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of the visitors, the industry, the environment and the host communities."



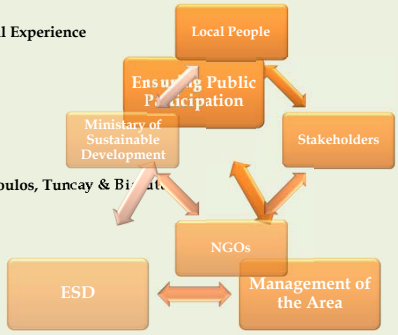
- Tourism : Amacayacu National Natural Park



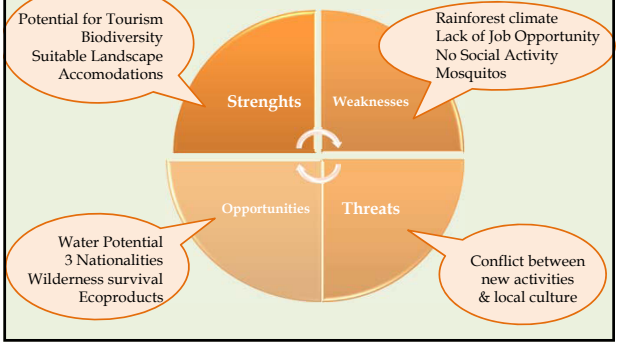
- Aims
  - To make local products more attractive
  - To ensure the public participation and the stakeholder involvement.
  - To start an education program for sustainable management.
  - To develop new activities based on eco-tourism.

Introduction | Methodology | Results | Conclusion-Recommendations

- Why this topic : Personal Experience
- Brainstorming
- Literature research
- SWOT analysis
- Interview Professors Scoulos, Tuncay & Bi...
- Play roles



Introduction | Methodology | Results | Conclusion-Recommendations



Introduction | Methodology | Results | Conclusion-Recommendations

- Development of a future market for fishes in the Area
- Education For Sustainable Development (ESD)
- Ecotourism

Strategy	Impact	Actions
		Catches
Modernizing equipments	Improved quality	• Develop research activities more related to inland waters, through consulting firms and research centres. • Obtaining financing options for fishermen • Install support activities according to the needs of changes. • Inform the subsequent elements of the distribution chain about the benefits of the changes.
		Processing
Develop processing activities	Add value to the products	• Search for financing options for the Cooperative
		Marketing
Better positioning of the product on the regional market	Increase the demand for the product, increase the selling prices, improve the image of the products	• Implement market surveys through consulting firms • Implement a publicity campaign in order to inform better the consumers • Establish different levels of association with members of the distribution chain
		Transport
Having more adequate transport unities	Reduce losses, More opportunities of delivery, better quality of the product	• Identification of better conservation and transport equipment • Identification of financing possibilities for their acquisition.

<u>Conclusion:</u> just information is not enough,
the key of success is evolution of minds and changing attidutes through ESD

Maria Dimopoulou
Galatia Politopoulou
Gizem Şahin
Petra Krmac
Vinciane Auguste

Topic:

The fire risks in the area of Parnassos National Park. Review of existing fire risk measures and campaigns and interventions to reduce fire risk in the protected area and proposal for their further development in the National Park and the surrounding region.

Figure 1: Map or Parnassos National Park core zone and surrounding area. Source www.projectplanet.net

Contents

1 Introduction

In this introduction we outline the definition of fire risk, the causes of fire, the role of fire in the ecology of forests especially in the Mediterranean region and why fire has become a major danger for Mediterranean ecosystems like the National Park of Parnassos and the biodiversity they harbour.

1a Forest fires in Mediterranean Ecosystems, causes and consequences

The dictionary definition of fire risk is something which is likely to cause a fire or make a fire worse.

Anthropologists identify the capture and control of fire as equal in importance, for humans, to the evolution of language. Fire moved from an entirely natural phenomenon to a largely anthropocentric one when indigenous peoples gained control of naturally occurring fire. In Greek mythology it was Prometheus who stole fire from Zeus and gave it to humans, an act for which he was punished.

Historic and contemporary wild-land fire is not a random event, natural, social, and cultural conditions cause it. How and when wild-land fire occurs, outside of naturally caused fires due to lightening, volcanic eruptions or spontaneous combustion of accumulating forest biomass, requires an analysis of such conditions and practices. The control of wild-land fires has become increasingly important, as the incidence of catastrophic fires has risen in recent years, especially in the Mediterranean region. In a world concerned with the greenhouse effect the preservation of the forests becomes paramount.

Fire is an integral part of many ecosystems particularly the Mediterranean ecosystem. Natural fire is part of the cycle of forest regeneration. It helps to clear forests from over-accumulation of organic matter which in the dry season can become very flammable. Fire helps create conditions for new seeds to germinate and grow. In the Mediterranean forests, vegetation is adapted for periodic fire (every 30-50 years), with features such as underground buds and seeds or heat resistant seed coats. No species of plant can be considered entirely or generally fire-adapted; plant species are adapted to a particular fire regime.

In recent decades the Mediterranean forests are under serious threat, with forest fires, in most cases deliberately or accidentally set by humans. The current frequency of fire exceeds the capacity of the forest ecosystem to cope with fire. Besides social and environmental impacts, forest fires produce considerable economic damages due to:

i) the large amount of resources spent in fire suppression and prevention; ii) the loss of commercial value of damaged wood products; iii) the costs related to loss of public non-market services (*i.e.*, biodiversity protection, water cycle regulation, supply of recreational areas, soil protection, carbon sequestration).

The Mediterranean has been identified by WWF and IUCN as one of the most important regions in the world for its outstanding biodiversity. We hence became interested in the fire risk management strategy of a Mediterranean national park, Parnassos in mainland Greece. Mediterranean forests are one of the planet's centres of plant and animal diversity.

An IUCN-WWF document on Mediterranean forest points out that:

- 25,000 floral species, 30,000 if sub-species are included.
- This represents 10% of the world's flowering plants on just over 1.6% of the Earth's surface.
- 13,000 endemic plants: the second richest area in endemic flowering plants in the world, just after the tropical Andes.
- Only 17% of the original 82% forest cover still exists.

In EU Mediterranean countries such as Spain, Portugal, Italy and Greece the average total burnt area has quadrupled since the 60's. The need for an effective policy of prevention to address the root causes of increasing fire damage to Mediterranean forests acquired a higher public profile following the devastating fires of 2007 in the Mediterranean region.

Greece has a typically Mediterranean climate of warm and dry summers, with the majority of fires in the country not due to natural causes. Since humans are a large part of the problem of forest fires the question of an education for sustainable development (ESD) addressing fire risk, becomes how to make those very humans a part of the solution.

Greece was ravaged by forest fires throughout the summer of 2007 that killed 84 people and burned 670,000 acres of forest and farmland. Arson and negligence are thought to have been the main causes and the phenomenon was repeated only two years later in 2009 with a further 21,000 hectares of pine forest, olive groves, shrub land and farmland near Athens burning. Aircraft were drafted-in to help from Italy, France and Cyprus at a cost estimated at 30 million euro's.

Table 1: Forest fires in Greece in the years 2000-2008

Data from the Ministry of the Environment Energy and Climate change

Year	No of fires	Hectares burnt	Forest hectares burnt	Mixed areas burnt	Human causes	Natural causes	Unknown causes
2000	2.581	145.034,0	69.579,0	75.455,0	336,00	129,00	2.116,00
2001	2.658	18.342,0	8.423,0	9.929,0	405,00	177,00	1.953,00
2002	1.400	4.337,0	887,0	3.450,0	140,00	154,00	1.106,00
2003	1.425	3.263,0	960,0	2.303,0	157,00	241,00	1.026,00
2004	1.755	10.722,1	2.586,0	8.136,1			
2005	1.544	6.437,4	2.180,2	4.257,2			
2006	1.417	12.661,4	6.513,1	6.148,3			
2007	1.992	222.894,0	85.970,6	136.923,4			
2008	1.486	29.172,0	13.397,0	15.775,0			
M.O.	1.806,4	50.318,1	21.166,2	29.153,0	259,5	175,3	1.550,3

1b The management of fire risk in Greece

Originating in the 1920s, Greek forest management and policies were modelled on methods of fire management and total fire suppression better suited to the cool and moist northern European ecosystems rather than the fire susceptible ecosystem of Greece. For around 50 years, until 1998, the Greek Forest Service of the Ministry of Agriculture was exclusively responsible by law for holistic forest management and protection, including fire prevention, total fire suppression and post-fire rehabilitation activities. In May 1998, fire suppression duties transferred to the Greek Fire Corps (fireservice.gr) which until then was responsible only for structural fires. It contributed to forest fire-fighting, just as the Greek army does, only when necessary. The Greek Fire Corps is under the Ministry of Public Order and Citizen protection (http://www.mopocp.gov.gr/main.php).
Most aspects of fire prevention, for example the patrolling of forests, remain with the Forest Service and/or the Ministry of the Environment, Energy and Climate change (www.ypeka.gr) and various regional-local authorities. The Forest service itself, was reorganized into regional structures without effective and consistent central coordination of activities across the country. As a result a fragmented and multifaceted fire management and policy seems to be in place in Greece.

The boundaries of state forests and the forests registry are incomplete (as is the land registry for the whole country) and construction within forests is still permitted, although, not in core zones of National Parks. National park management services are permanently understaffed. It is notable that Greece spends about ten times more on fire suppression relative to fire prevention.

1c The Parnassos National Park (PNP), Greece

Mount Parnassus (Greek: Παρνασσός), is a mountain of limestone in central Greece that towers above the ancient site of Delphi, north of the Gulf of Corinth. According to Greek mythology, this mountain was sacred to the God Apollo and the Corycian nymphs, and the home of the Muses.

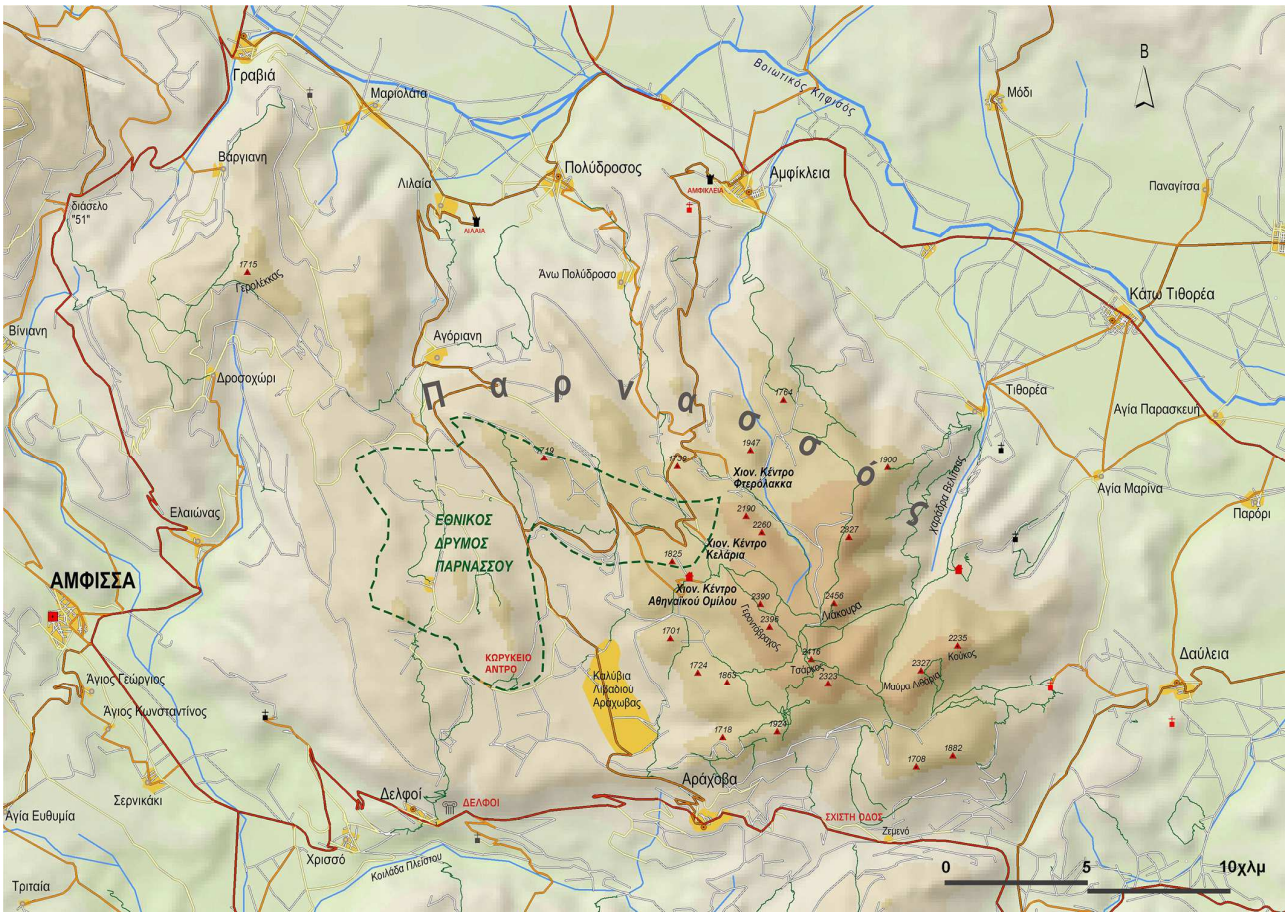


Figure 2: Parnassos national park (in green) and surrounding area. Source: google images

Parnassos National Park, founded in 1938 is one of the oldest National Parks in Greece. It was founded together with that of mount Olympus. It includes the SPA "Oros Parnassos" (GR 2410002), the largest part of which is supervised and protected by the Parnassos National Park's

Management Body (PNPMB). In addition, the Network "Natura 2000" subjects it to the EU Habitats Directive 92/43/EEC (for their integration and protection) and so the maintenance or restoration of habitats should be ensured, according to the principles of sustainability. The SAC "Notioanatolikos Parnassos – Ethnikos Drymos Parnassou - Dasos Tithoreas" (GR 2450005) has been institutionalized on Mt. Parnassos, and is the largest part of the responsibility area of (PNPMB). Finally, the Archaeological Site of Delphi and the wider landscape of Delphi were institutionalized under GG. 147/A/2012 .

National Parks in Greece are meant to be reserves for flora and fauna with minimal tourist facilities such as basic campsites and refuges and many walking trails. Management of the parks usually consists of a buffer zone protecting an inner core zone. The idea behind a core zone is that it provides for an area where the ecosystem is minimally disturbed and only low impact research and use can be permitted, to secure the biological diversity of the area. Only walking should be allowed within the core zone, whereas more activities including habitation and on certain occassions hunting, are possible in the buffer zone. Settlements on Parnassos Mt. go back in history long before it became a protected area to 1500 BC. From the foot of the mountain at around 350 metres above sea level up to an altitude of 1.200m 18 villages with populations ranging from 300 to a few thousand exist. Inhabitants are engaged in agriculture, livestock, manufacturing, mining and tourism. The peak of the mountain is at 2,457 metres.

The Parnassos National Park Management Body (PNPMB) was established for the protection, conservation, management and enhancement, of both nature and landscape of the mountain, as natural heritage and valuable natural resource and for ensuring that human activities within the PNP meet this goal. It is a Private Legal Entity supervised by the Ministry of the Environment, Energy, and Climate Change, governed by an 11-member Board, composed of representatives from ministries, services, local authorities, NGOs and scientists. The main objectives of the Management Body are:

- The conservation of natural resources, biodiversity and protection of the entire region.
- Promoting and implementing of information and awareness campaigns for the local community.
- Attracting visitors and promoting the values of the protected area.
- Sustainability of the protected area‘s ecosystems.
- Developing partnerships with research centres, universities and NGOs.

We examined the practices for fire risk management of the area under the PNPMB. It seems however obvious that a comprehensive fire risk management and education policy should address the needs of the entire region.

2 Methodology

We attempted to evaluate the extent to which the PNPMB is successful in the fulfilment of its main objectives (outlined in the previous paragraph) in relation to fire risk management. Our aim was to propose how they can be improved-enhanced especially with regard to ESD for fire risk.

Why we chose this topic?

- Trees are important carbon dioxide sinks and reduce the greenhouse effect so their protection from fire is important

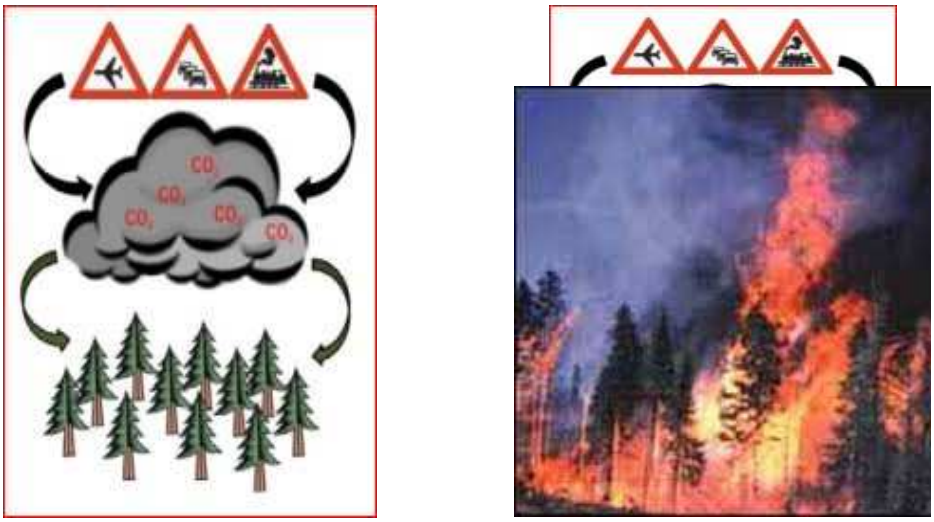


Figure 3; Trees acts as greenhouse gas sinks, burning them would eliminate this

Source; google images and TES.co.uk lesson on trees

- Fire seemed interesting because it is not only a risk and danger for human life and natural ecosystems but also part of their regeneration cycle.
- None of us had studied fire risks before and so this was a novel topic, not well covered in the ESD in Biosphere reserves and other designated areas resource book we were given for the summer school.
- Fire seems a good topic for teaching children and young people about personal responsibility towards the forest ecosystem, since most fires in recent decades are due to human causes

Our methodology can be summarized by the above diagram.

Following our initial brain storming session on what constitutes fire risk, initial internet search related to PNP (mostly on their official website and a search for maps and fire ecology literature), a reading of the fire management plan for the Samaria Gorge that Maria Dimopoulou provided and a visit to a part of PNP, we decided to consult with Dr Tuncay about fire risk management in National Parks. We then used SWOT analysis to reflect on our somewhat limited perceptions of what is in place at the PNP regarding fire risk management and organise our data and the information we had collected to date. Establishing where the authority for fire risk management and suppression in Parnassos lies and the legal-legislative framework that governs fire risk management in Greece was difficult online, and so we contacted directly some authorities, for example people who work on the PNPMB and the Chief Forester of Amfissa, and our colleague Savvas Vasileiadis, who is employed at Mount Olymbos, and the fire brigade for the area. We were not always successful in finding people or information given limited time, and were often referred to 'other' authorities or people with 'more' responsibility. This is why we do not present data on frequency of fire in the area and budgets for the various fire and forest management authorities. After completing a SWOT analysis on fire risk management at the PNP, we contacted authorities again with more detailed questions about what measures for fire risk management information dissemination and education are in place and how they engage stakeholders. We also did some research on existing educational games for fire management or suppression.

3 Results

3a Existing fire risk measures and campaigns and interventions to reduce fire risk in the Parnassos National Park

Taking the PNPMB objectives and reviewing them from the point of view of fire risk and fire management we established the following practices and problems in the Park.

1. For the protection of the area from fire only five permanent staff and four non-permanent summer staff patrol the area (mostly in the core zone). They have access to water tanks for immediate response to fire, and are in constant contact with the Forestry authorities and the fire brigades of the region, for example in the nearby cities of Lamia-Amfissa and Livadia. This is a woefully inadequate force for an area of 3,513 hectares

Figure 4; Entry to the PNP sign and fire risk warning sign in the background. Source; google images

2. They try to promote the value of the PNP as a protected area of rich biodiversity through visits to schools as well as open to the public information days, including limited education on fire related topics.

3. They encourage the audience of such events to participate in tree planting and they always send representatives to educational and information activities organized by others in the surrounding area to inform them about PNP

4. They plan to initiate species recording and monitoring and related ecological studies

5. With regard to control of entry to the PNP there is no information for visitors at park entry points or anywhere else. The fact that the boundaries of the area of responsibility of the PNPMB and of the entire National park beyond the core zone are not well defined complicates matters. Voting of legislation better defining the PNP zones and boundaries is awaited eagerly. The ski resort is within the core zone presently, due to be excluded when

the new legislation will come into effect. It belongs to the ministry of Tourism, as does the archeological site at Delphi, and the former will likely be sold to private investors. None of its profits return to the PNP. Traffic in and out of the ski resort, within the core zone, is not in accordance with the principle of zonation in National parks and other protected areas.

6. No information or educational material for distribution to visitors and inhabitants currently exists, although it has been commissioned and its production has gone out to tender. We didn't manage to get information on the nature of such material.

The completion of the process of bringing legislation to better define the zones in the PNP into effect and define the boundaries of the PNP, will also facilitate the implementation and/or further development of legislation on fire-proof (so far as possible) construction within the buffer zone of the PNP. The staff of the PNPMB told us that they believe fire protection measures worked better when both the prevention and suppression of fire belonged to one ministry-authority. The fragmentation of responsibility for fire risk management and suppression may not serve the needs of the PNP best. Limitations of funding and staff shortages are a major issue hindering the implementation of their strategies for fire risk and overall biodiversity management, protection and education in the PNP and emphasize the need for engagement of the public in such practices through ESD for fire risk.

3b SWOT analysis of fire risk management in PNP

Our SWOT analysis for fire risk management in the Parnassos National Park identified the strengths and weaknesses of the existing plans, the threat sources and the opportunity that educating for fire risk management, humans, who are the main threat to the PNP, represents**.**

Table 2 SWOT analysis for fire risk management at Parnassos National Park (PNP)

Strengths	**Weaknesses**
Patrolling of the park by foresters Maintainance of fire corridors Water tanks Organizing public information –education days	Only 5 (9 in summer) patrol 3,513 hectares Rubbish in PNP Water tanks plastic Few fire sings Imprecise boundaries-zonation in PNP Lack of maps of PNP with fire risk and biodiversity information about PNP Lack fire risk specific educational activities Residential communities within PNP
Opportunity	**Threat**
Inhabitants& Visitors to PNP Fire risk ESD & for best practice in at point of arrival Disseminated to all of local communities and targeting visitors&children	Inhabitants& Visitors to PNP Natural causes, man made causes like arson &waste, Fragmented fire services

4 Recommendations & Conclusion

4a Recommendation for further development of fire risk management practices and related ESD education in the PNP and the surrounding region.

Figure 5 An ESD proposal for fire risk in Parnassos National Park targeting visitors and all children (both of visitors and inhabitants)

Three key words come to mind when reflecting on effective management to control fire risk. Prevention, Education and Coordination (of efforts)

Regarding prevention and education we propose a two fold approach:

1) To develop and distribute good information and detailed maps on the PNP, detailing its paths, trails and roads, its natural and cultural heritage and the fire risks in the area. This information ought to be distributed to all local communities, in houses, schools, local bussinesses such as hotels and restaurants, local authorities, the ski resort, Delphi

archeological site and at stop and rest visitor centres that we propose should be constructed, at all road and walking path entrances to the park. This would be as a first step in making people aware of the area they visit, its wealth of biodiversity and the fire risks in the area. At least two of the above proposed visitor centres at a couple of important-busy entry points to the park, could be made into environmental education outposts specific for the PNP. There, a more in depth exploration of the area and its biodiversity-resources would be facilitated for all visitors, including fire risk management education. The role of fire in forest ecology should be part of the educational materials on fire. Tourist information for the area can and should be linked to any information regarding the biodiversity and fire risk in PNP. The detailed map of the area we propose, can be further developed into an educational board game for school children (and adults). Moving around the map with good fire risk and sustainability practices, would allow the players to reach their destination and win, poor practices would penalize them, in the process knowledge about the area and local sustainability issues could be supplied via questions, with correct answers earning players steps forward toward the destination.

2) To engage the local young people and visiting children, through engagement of their teachers and parents in experiential learning through activities about fire risk management within the PNP. Examples include rubbish collection within the PNP and biomass clearance in high season. The degree of interest-participation for and in such activities, before and after distribution of the information materials proposed above, would be a measure of the success of the information campaign and provide direct feedback to the PNPMB on how to improve the former. Putting all the information proposed above and upcoming educational and other activities, on the PNP website (parnassosnp.gr) but also on online education portals nationwide and social media websites like facebook and twitter, should facilitate the work of PNPMB on fire prevention but also advertised the protected area of Parnassos nationwide and beyond.

Concerning coordination of fire risk efforts, while we don't feel sufficiently informed regarding the legislative constrains on the issue we agree with the PNPMB employees we spoke to that it maybe more effective for fire risk management if management and budget structures where in place to facilitate easier communication and exchange of ideas, expertise and management plans between forestry and fire experts and people on the ground who try to implement relevant to fire risk policies.

4b Conclusion

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Fire and Society: A Comparative Analysis of Wildfire in Greece and the United States

Martha Henderson, Kostas Kalabokidis, Emmanuel Marmaras,

Pavlos Konstantinidis and Manussos Marangudakis

University of the Aegean, Department of Geography, 81100 Mytilene, Greece

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Post-fire forest management in southern Europe: a COST action for gathering and disseminating scientific knowledge

Barbati A , Arianoutsou M , Corona P , De Las Heras J , Fernandes P , Moreira F Papageorgiou K , Vallejo R, Xanthopoulos G

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7) http://www.forestry.gov.uk/pdf/eng-trees-and-climate-change.pdf

8) Times Education supplement educational resources, www.tes.co.uk

9) www.protectedplanet.net

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11) http://www.gnto.gov.gr/v

The concept map below illustrates how all stakeholders, not just visitors to the park, should be engaged in education for fire risk management. According to FAO's 'International Handbook on Forest fire protection', people have to be convinced that forest protection from fire is essential and informed on how to participate in fire protection, for any fire management plan to be effective. This principle should underlie the development of any ESD for fire risk management and the approach should be bottom up. The aim is always to engage as many inhabitants and other stakeholders in ESD so that they become informed ambassadors of good practice and of current science relating to forestmanagement including fire management. People should eventually become active aware participating in their community citizens motivated to safeguard their environment through ESD for fire prevention. Hopefully an active interest in local environmental protection and sustainability makes one interested in global environmental protection and sustainability for fire risk management (but also any other ESD issue).

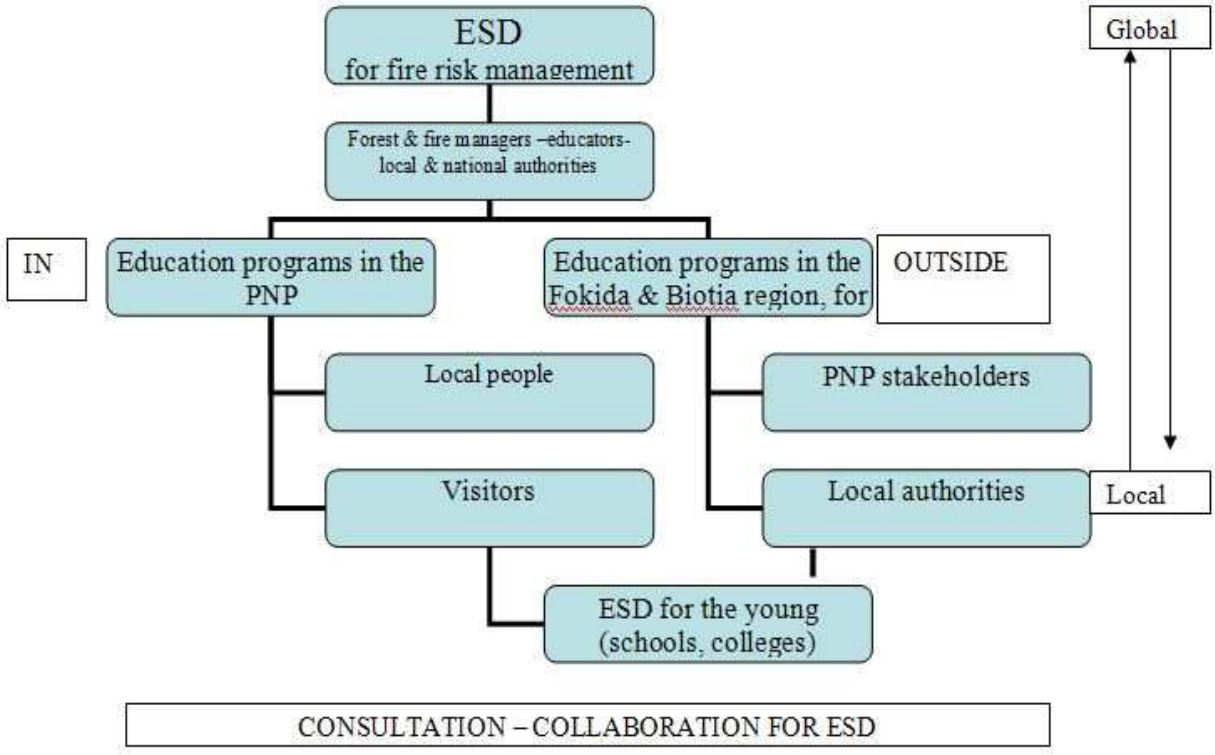

Figure 6 Concept map of how ESD for fire risk should proceed from a consultation collaboration at local level and progress nation-wide

Summer School on Education Sustainable Development
in biosphere reserves and other designated areas

Prepared by:
Maria Dimopoulou
Galatia Politopoulou
Gizem Şahin
Petra Krmac
Vinciane Auguste

Topic:
The fire risks in the area of Parnassos National Park.

Review of existing fire risk measures and campaigns and interventions to reduce fire risk in the protected area and proposal for their further development in the National Park and the surrounding region.

Amfissa, Greece, 17th July 2014

Fire risk at Parnassos National Park (PNP) and its management

Definition of fire risk:

Aim & Methodology

Why this topic?

Aim

Review fire risk management on PNP

Propose improvement of fire risk management for PNP

Propose ESD related to fire risk in PNP

Work process

Brainstorming → Research → Interview → Observation & writing

Fire is part of forest ecology
Fire was novel topic for us
Good topic for educational intervention
On personal responsibility

Results : SWOT analysis for fire risk

S strengths	W weaknesses	O opportunities	T threats
Patrolling Fire corridors Water tanks	Only 5 (to 9) on patrol for 3,513 hectares Rubbish in PNP Water tanks plastic	Inhabitants& Visitors to PNP	Inhabitants& Visitors to PNP
Public information Sessions Educational	Few fire sings Poor boundaries	Fire risk ESD & for best practice in PNP Target visitors&children	Natural causes Man made causes e.g. waste,

ESD for fire risk management

Build a **fun** program of fire risk education

Visitors | Children

Information | Maps (and map based games) | Rubbish collection | Biomass clearance

Thank you for your attention
Ευχαριστούμε για την προσοχή !

Christina Anastasiadi – National and Kapodistrian University of Athens, Greece
Elitsa Ivanova – Bulgarian Biodiversity Foundation, Bulgaria
Perrine de Lansalut – University of Bordeaux, France
Janina Torkar – University of Primorska, Slovenia

INTRODUCTION

The scope of this project was to compile a set of guidelines for the development of educational programmes with the specific aim of education on ESD utilizing the medium of food.

The American Public Health Association (APHA) defines a sustainable food system as one that:

> "*… provides healthy food to meet current needs while maintaining healthy ecosystems that can also provide food for generations to come with minimal negative impact to the environment. A sustainable food system also encourages local production and distribution infrastructures and makes nutritious food available, accessible and affordable to all. Further it is humane and just, protecting farmers and other workers, consumers, and other communities."* (APHA, 2007)

This provides a good initial guideline as to how an effective education on sustainability should be constructed. Starting from there, it can be enriched to include specific elements on culture, ecology and biodiversity adapting to the specific audience, locality, seasonality and availability of resources.

Aside from its environmental aspects, sustainability is also about involving the younger and older generations, learners and educators, locals and visitors, national and international communities in the economical and environmental issues that relate to food production and consumption (e.g. water and energy footprints, food miles). Diverse groups of people could thus benefit from an education on sustainability. Such groups could include:

- professionals in the cosmetics and pharmaceutical industries (including such practices as aromatherapy or homeopathy) – e.g. beauticians, yoga instructors, scientific researchers etc
- organizations specializing in nutrition, health education and consumer awareness
- Ethnography or Cultural association enthusiasts (customs and traditions of the area, feasts and special occasion food, music to accompany food)
- professionals specializing in athletic education and coaching
- foodies, gourmets and epicures
- school children and official educators – locally, nationally and internationally
- NGOs (e.g. Slow Food, Locavore Movement)

Education can be loosely defined as "*a form of learning in which the knowledge, skills and habits of a particular group of people are transferred from one generation to the other through teaching, training or research.*" (Wikipedia Online Encyclopedia, n.d) Any experience that has a formative effect on the intellectual and emotional development or actions of a person could be considered *educational*. It can be inferred from the definition that there are many ways through which such a transfer, or formative effect, can occur. It could be under the guidance of third parties (professional teachers or not), or autodidactic. It could be intentional or unintentional from the learner's point of view.

At the beginning of any educational approach it is imperative to define clearly two things:

- Who is the learner (audience)
- What are the desired outcomes

Having determined the intended group of learners, the educational approach should then set some clear scopes or guidelines.

Among contemporary educators, the prevailing generic categories are the Formal, Informal and Non-formal ways of learning. The European Centre for the Development of Vocational Training (Decefop) defines Formal, Informal and Non-formal Education respectively as:

> "*Learning that occurs in an organized and structured context (in a school / training centre or on the job) and is explicitly designated as learning (in terms of objectives, time or learning support). Formal learning is intentional from the learner's point of view. It typically leads to certification.*" (Cedefop, n.d.)
>
> "*Learning resulting from the daily work-related, family or leisure activities. It is not organized or structured (in terms of objectives, time or learning support). Informal*

learning is in most cases unintentional from the learner's perspective. It typically does not lead to certification." (Cedefop, n.d.)

"*Learning which is embedded in planned activities not explicitly designated as learning (in terms of learning objectives, learning time or learning support), but which contain an important learning element. Non-formal learning is intentional from the learner's point of view. It typically does not lead to certification.*" (Cedefop, n.d.)

Thus, a holistic education that aims at a spherical, effective *paideia* should incorporate methods from all three categories above.

This project's scope was focused at forming and developing educational guidelines towards raising awareness on sustainability of a diverse group of learners, from school children to seasonal tourists and visitors, from leisure seekers to dedicated professionals. The pedagogical approaches should incorporate various didactical processes, from the traditional lecture and presentation method to experiential workshops and projects, adjusting to the aforementioned parameters of audience, locality, seasonality and availability of resources.

To consider the final parameters of locality and availability of resources, this effort drew inspiration from the locality of Mt. Parnassus and the surrounding area, utilizing agricultural products and existing infrastructures into the formation and development of guidelines (e.g. tourism and its related industries).

Mt. Parnassus is a mountain located in central Greece, across the prefectures of Viotia, Pthiotida and Fokida, north of the Gulf of Corinth. It is one of the tallest mountains in Greece, home to the archaeological site of Delphi and contains two ski resorts and a homonymous National Park. The area on and around the mountain has a great wealth of flora and fauna.

In particular in the prefecture of Fokida (including Mt. Parnassus) some of the most widespread, traditional products[1] are:

- Meat (sheep, lamb, goat, beef)
- honey
- milk and dairy (yoghurt, feta, formaela, mizithra)
- olives and olive oil (Elaionas olive grove near Amfissa)
- wine and tsipouro
- wheat and its derivatives (bread, paksimadi [particularly of Desfina], trachanas, pligouri)
- herbs (including oregano, lavender, rosemary, mountain tea)
- mushrooms (at least 150 recorded species in the Park area)

METHODOLOGY

For this essay a variety of research methods were used, including literature and desktop research (i.e. herbs and mushroom books and prospecta), interviews and conversations with experts and field research and observations.

Furthermore, degustation of a variety of locally sourced products took place over a period of one week (in-house and on selected locations in Amfissa, Agoriani and Galaksidi). During that time, a wide variety of different traditional foods and beverages were tried (including varieties of olives and olive oils, breads, dairy and wine).

For the composition of the guidelines, the research team in the initial phase implemented brainstorming in order to compile a list of, among other things:

- raw materials
- traditional agricultural products, practices and customs
- examples of good practices

that could provide the basis for the guideline compilation. Each member of the team was then assigned with a specific subtopic on which to expand the research (e.g. for the Introduction the

subtopics included “Sustainability”, “People”, “Education” and “Food”). The final recommendations resulted from the combination of materials gathered on each subtopic.

RESULTS & DISCUSSION

The multicultural composition of the researchers’ group was beneficial, since through the sharing of personal observations and experiences elements from both the tangible and intangible cultural heritage were exchanged. This approach pinpointed similarities and differences in the perceptions of sustainability, education and food. These were then exploited in order to approach the scope from different viewpoints, simulating the different perceptions of diverse target groups.

It is of utmost important however, that any resulting guidelines or educational activities especially consider the environmental and socio-economical singularities of each region, aside from the aforementioned generic parameters of target group and resource availability.

In particular, extra care should be given during stakeholders mapping, so that a balance can be achieved in accounting for local, national and international interests.

CONCLUSION & RECOMMENDATIONS

The unanimous conclusion was that food and agricultural products and practices, if correctly exploited, can provide a versatile medium through which can result long-lasting and effective education on sustainability, leading in turn to the development of environmentally responsible consumer behavior.

An important element that should act as an axis around which to develop guidelines for education on sustainability is that of *intangible cultural heritage*. This includes customs, crafts, experiences, traditions, practices, and rituals (oral or written, of social, religious, festive nature) that concern such transcendental issues as food, the relation of man to nature, life in an organized society, the collective memory of peoples etc.

A particularly interesting point was made vis-à-vis intergenerational workshops in combination with social entrepreneurship. Especially for older people living in more remote parts of the country, intergenerational workshops provide them with the opportunity to pass on their experience on different skills and crafts. Food is a useful medium in that sense, allowing the passing of knowledge of traditional preparation methods to youth. At the same time, social entrepreneurship could be promoted by employing vulnerable or traditionally ostracized groups of people (e.g. unemployed individuals, immigrants or people with a conviction record).

In developing the guidelines section, it was decided that the central idea around which the list would expand (horizontally, vertically or in a web) would be:

“If an activity is said to be sustainable, it should be able to continue forever.” (Anon)

Finally, some generic guidelines and examples of Good Practices (see APPENDIX I) were compiled.

GENERIC GUIDELINES

- Intergenerational workshops combined with social entrepreneurship (younger people learning skills, crafts etc from the older generations), thus utilizing and managing the social capital.
- Workshops and activities (year-round or seasonal) developed around themes such as:
    - Innovative recipes and re-invention of old recipes using the same ingredients
    - Homemade cosmetics from locally sourced materials (e.g. soap from olive oil and honey)
    - Healthy eating / Mediterranean dietary workshops for visitors
    - Culinary / green gastronomy workshops for preparing and eating food using local materials

    - Crafts and arts workshops (e.g. wood carving workshops using local wood such as olive wood from local grove
- Create NGO about sustainable development through food – for activities such as fundraising, event organization/management etc.
- Create webpage / online catalogue for ordering and delivering agricultural products within a specific radius ("30 Kilometer rule", minimal ecological footprint)
- Create, support and expand a "Local Food Bank" (recording and archiving not just produce but also techniques, books, catalogues, audiovisual data)
- Combine individual Food Banks to create a wider network (for authorities on local, national and international level)
- Create database linking foods and products with festivals and events, localities, dates and travellers' information [see template (Table 1) in APPENDIX].

NOTES

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- Indigenous Food Systems Network http://www.indigenousfoodsystems.org/
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- "Foodscaping" http://en.wikipedia.org/wiki/Foodscaping

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APPENDIX

FOOD / PRODUCT	***FESTIVAL / EVENT***	***LOCATION***	***DATES / SEASON***	***LINKS***
Honey	Honey festival	Antimachia, Kos island, GREECE	August 15th	http://www.kosinfo.gr/villages/antimachia
Wine and vine products	Bordeaux Wine Festival	Bordeaux, FRANCE (and other places)	2014: see program of events	http://www.bordeaux-wine-festival.com/
Wheat and Bread	Bread festival	Garvan, BULGARIA	Summer, before harvest (June – July)	http://visit.guide-bulgaria.com/a/334/bread_festival_%28juny_or_july_-_before_harvest%29.htm
Meat	Bograč fest	Lendava, SLOVENIA	2014: August 30th	• http://www.lendava-vabi.si/bogracfest_en.html • http://www.slovenia.info/?prireditve=0&lng=2
…	…	…	…	…
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THE EFFECTIVENESS OF EDUCATION OF PEOPLE ON SUSTAINABILITY THROUGH THE MEDIUM OF AGRICULTURAL PRODUCTS AND RELATED PRACTICES FROM THE PARK OF PARNASSOS AND THE SURROUNDING AREA.

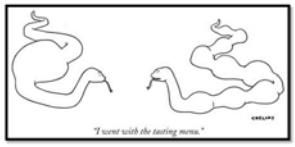
SUMMER SCHOOL
ON ESD IN PROTECTED AREAS
JULY 2014, AMFISSA, GREECE

INTRODUCTION

- Sustainability
- People
- Education
- Food
- Locality, seasonality and availability of resources

The effectiveness of education of people on sustainability through the medium of agricultural products from and related practices in the Park of Parnassos and the surrounding area.

METHODOLOGY



- literature research
- desktop research
- interviews and conversations with experts
- field research and observations
- personal experiences and exchange of opinions
- degustation

The effectiveness of education of people on sustainability through the medium of agricultural products from and related practices in the Park of Parnassos and the surrounding area.

RESULTS & DISCUSSION

- Effective education and awareness raising method
- Intergenerational workshops combined with social entrepreneurship
- Responsible Environmental Consumer Behavior
- Intangible Cultural Heritage
- Involving diverse groups of stakeholders (local people, local authorities, visitors, youth, NGOs)

The effectiveness of education of people on sustainability through the medium of agricultural products from and related practices in the Park of Parnassos and the surrounding area.

CONCLUSION & RECOMMENDATIONS

- It is an effective educational method.
- Main guideline: *"If an activity is said to be sustainable, it should be able to continue forever."*
- Local Food Bank and wider Food Bank Network
- Green gastronomy, seasonal culinary schools and workshops
- Link local events with international movements (e.g. Slow Food, Locavore)
- Database of cultural events, foods, locations, seasons and travellers' information.
- …and many, many more… (e.g. fundraising events)

The effectiveness of education of people on sustainability through the medium of agricultural products from and related practices in the Park of Parnassos and the surrounding area.

The effectiveness of education of people on sustainability through the medium of agricultural products from and related practices in the Park of Parnassos and the surrounding area.

Giulia Lo Re
Svetlana Pejovic
Elizabeth Zikou

The importance of organic farming for a protected area

The scope of this work is the presentation of several ideas about setting up an ESD centre near a protected area (P.A.), which focus on Organic Agriculture. The idea of this specialization was conceived by taking into account the multiple benefits of promoting organic farming around a P.A. The positive effects of expected reduction of air-, water- and soil pollutants are related with a more substantial conservation of a P.A. In addition, through educational and training programmes on organic farming around a P.A, people may be familiarised with the importance of P.A.s and in what ways its conservation can be achieved. Finally, the promotion of organic farming, apart from being environmentally beneficial, may have advantageous socio-economic aspects (Cobb *et al*., 1999).

Objectives of the ESD centre

The suggested ESD centre aims at:

- **Education:** increase of public awareness on environmental matters, i.e. related to P.A., through a perspective of Sustainability
- **Social inclusion:** training unemployed people on organic farming for future occupation
- **Innovation:** the development of new agronomic technics via researches
- **Sustainable Tourism :** enhancing sustainable tourism of the area with specialised programmes
- **Economy:** increase of the local economy by achieving the goals referred above

For the realization of these objectives, it is crucial to find land, buildings and financial support. Moreover, employing experts and inviting volunteers who want to be part of the setting up and could be work on land management, educational program planning, and promoting of the ESD centre (organizing a website, newsletter and promo-material) is needed.

Fundraising

According to the previous experience, effective education centres for sustainable development required ongoing financing that may come from international funds, nationals funds or even funds coming from the municipality (UNESCO, 2013). Self-financing options is an important part of ESD centres' livelihood and could guarantee the development of long-term projects in the territory.

Purchase or Donation of Land

The first option considered for the "acquisition" of the land is donation or rent from public or private authorities. This procedure could be relatively cost-effective, in particular in areas where the price of the land is very low (UNESCO, 2013). The

donation from public authorities reflects a direct collaboration focused on the valorisation of public land, an example of a sustainable development action

- **Rural development 2014-2020**

Before the creation of ESD centre, the development of organic farming lands of the ESD centre is needed and it requires several financing that may come from the European commission and the Rural development plan 2014-2020. In line with Europe 2020 strategy and the overall CAP objectives, three long-term strategic objectives for EU rural development policy in the 2014-2020 period can be identified:

- ✓ fostering the competitiveness of agriculture
- ✓ ensuring the sustainable management of natural resources and climate action
- ✓ achieving a balanced territorial development of rural economies and communities including the creation and maintenance of employment

Funding may be obtained partly from the European Agricultural Fund for Rural Development (EAFRD) and partly from national / regional and sometimes private sources (EC, 2014).

- **Local Authorities and Municipality**

In order to enhance the link between the ESD centre and the local authorities, the maintenance of the structure could be carried out from the municipalities. The development of these connections is a fundamental step for the acceptance and involvement of local community in the ESD.

- **Ministry of Education**

Education, being the core of such an initiative, should be supported by a qualitative service that include technological instruments and specialised crew with field and laboratory experience. For the achievement of this, the contribution from the Ministry of Education may be needed.

Some of the funds may be obtained from European Commission for Education and training and from several agencies such as School Building Organizations (OSK) or School Book Publishing Organization (OEBD)

- **Associations and NGO's**

This type of donors could contribute through voluntary donations or small annual fees in order to spread the awareness and contribute to our annual budget.

Self-financing options:

- **Brand Name product**

The ESD centre may sell part of the products deriving from the cultivation of vegetables and herbs to the visitors/ tourists or through the internet support (UNESCO, 2013).

The product itself and the label should underline that part of its production is done with the contribution of visitors, as a memento of the experience they have lived.

- **Fees from farmers and tourists**

The special daily program for tourists and the training programmes that refer to existing farmers that aim at cultivation conversion could be accompanied with special fees

Education & Training

Target groups

The education or/ and training target groups offered by ESD-centre will refer to the categories of people below:

- students of primary and secondary school of all over the country
- adults that are interested in learning about organic farming (local people and tourists)
- farmers at local and national level
- unemployed people
- under- and post-graduate students of highest level education that are interested in having the internship on organic farming fields

The indoor and outdoor activities should be adjusted to the characteristics of the group that refers to, such as age, interests and level of knowledge.

Aiming at the constant improvement of the ESD centre programmes, visitors and trainees will take part in evaluation procedures, via questionnaires and discussion, before and after the educational interventions and training.

Inside the ESD centre

In the building of the ESD centre, a main hall is needed to be used for attending lectures and discussions. In addition, a hall equipped with desktops could accommodate a variety of workshops.

Apart from a lecture and a workshop hall, the building may be consisted of several rooms dedicated to different topics. In these rooms, all the categories of visitors may have the opportunity to get familiar with the meaning and importance of organic agriculture and sustainability as well as the multifaceted relation of a P.A. with the wider area before the outdoor sessions, where things are to be seen in a real-word context.

The rooms should be adequately equipped with educative means such as computers, projectors, sound systems and interactive whiteboards and properly decorated with photographs, maps, posters and paintings, aiming to be used as educative tools.

Each educator of the ESD centre may initially present the topic of each room and then serve the role of the instructor and facilitator in a series of discussions and student-centred learning methods such as inquiry- and problem-based learning. Researches show that these constructivist approaches may enhance students' argumentation skills (Sampson, 2010). In addition, role playing is a method that promotes active learning and enthusiasm (Bonwell & Eison, 1991). These type of methods promote critical thinking, which is a key ingredient for the holistic approach of Sustainable Development issues. Moreover, taking into account students' prior ideas and focusing on their interests and on applying knowledge on real –life issues is of high importance (Dewey, 1952). All the above can be applied outdoors, too.

More specifically, the room topics may be:

- **the sustainability and its applications on our everyday life:** recycling and upcycling of materials, alternative energy sources such as photovoltaic panels, mindful use of electric energy
- **general ecological concepts** related, for example, with the energy cycle and food chains and with the biodiversity, giving examples of local species interactions, highlighting those of the protected area.
- **the relation between organic agriculture and sustainable development** referring to environmental, social and economic aspects (i.e decrease of unemployment, increase of income in an environmental friendly way), giving examples of the local area and concluding to the importance of organic agriculture in global scale.
- **the benefits of organic agriculture specifically on the conservation of a P.A. the connection of a P.A. and the economy of the local area**.

Outdoors

- **Protected Area:**

Visitors and trainees may engage in various field work activities in the P.A. so as to become acquainted with its special characteristics, be it flora and fauna species and their interrelationships, the abiotic factors etc. This aims to raise awareness, the interest, and the willing to be a member of this protection effort. The learning methods referred above are suggested for outdoors, too.

- **Organic farms**

For all the target groups, the visit at ESD centre's and local organic farms would be a hands-on experience, adjusted at the level and interest of each category of visitors. People will have the opportunity to get involved in the everyday procedures of the farms and get familiarised with the methods, tools and materials that are being used. Via discussions with organic farmers, visitors could discover the contribution of tradition in local farming, ways to overcome difficulties and be informed about the distribution of the products. Emphasis should be given to the procedure as a whole, through which a product gets to our hand, ready to be eaten. At the end, the conclusion of these visits should be the realization of the exact ways that organic farming supports the conservation of a P.A.

Moreover, local organic farms is an ideal training place for unemployed people who want to get involved in agriculture and farmers from all over the country that aim at switching their conventional crops to organic. Seminars on organic farming may be scheduled systematically during the year. Research may grow at organic farms of the area where under- and post-graduate students of highest level education interested in organic farming, may have their internships.

- **ESD centre gardens**

At the ESD centre outer area, visitors may take gardening classes at different type of gardens, i.e. with herbs, edible flowers, cut flowers or vegetables and be able to know how to create and maintain their own one.

The gardening classes may be combined with cooking classes aiming to provide ideas about ways to preserve the products during the whole year (i.e. jarred preserves, pickles, and pestos) following local traditional recipes. In addition, workshops on how and when to harvest herbs, how to dry and store them properly and how to prepare simple herbal remedies for everyday use may be combined, too.

It is recommended that each person, by the end of the visit, to take a little plant in a pot with them, to replant at their home. This memento at urban windows, balconies and gardens may help the ideas of the ESD centre to grow and spread.

Pre- and post-visit: distant e-learning sessions

A distant e-learning session is recommended for future visitors, especially students (young or adult) and teachers to be attend before and after the visit to the ESD centre. The objective of the pre-visit session is to act as an "advance organizer" -a tool introduced by Ausubel in the 60s- that is helpful for the students to organize the incoming information. This include the directing of attention to the important concepts and some relations of the coming material and a way to connect these elements with relevant prior knowledge (Woolfolk *et al.* 2010), which makes the learning meaningful. The teacher-specific pre-visit session will be a kind of training for them in order to be able to support the educational process during the visit. The after-the-visit session will act as a means for students to keep in touch with the progress of the agricultural procedures, so as to observe its sustainable facet through time.

Future perspectives

After several years of function of the ESD centre, the achievement of the initial goals and its economic adjustment, the effort may get more extended, aiming at:

- **Collaborations:** with other type of farms, such as pet therapy farms
- **Social inclusion:** creation of programs focused on children with special needs
- **Funding:** as result of increasing programs and involvement of heterogeneous partners, new sources of funds may requested
- **Connectivity:** creation of a network among the organic farmers of the area that may enhance the productivity by synchronising the use of up to date methods and the promotion of the products to the market.

- **Economy:** the expected results of the creation of the farmers' network mentioned above may have a significant effect on local economy. Economy improvement is a fundamental component for the development of durable projects and it could act with a positive feedback.
- **Creation of a buffer zone around the P.A.:** taking into account that organic farming has been under rapid development all over Europe (Agency, 2006), it the creation of a wide area of organic farms is possible, with new and converted cultivations, around the protected area that may play a significant protective role for it.

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Power Point Presentation Handouts

Setting up an ESD centre for a protected area: objectives; prerequisites and tools

Work group I

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What?

***Establishing* an Educational Center for Organic Agriculture (ECOA) who will provide:**

- **Education**: increase the awareness of the community
- **Social inclusion**: unemployed and children with special needs
- **Connectivity**: connection among the organic farmers of the area
- **Innovation**: new agronomic technics, botanic garden
- **Tourism** : improving the sustainable tourism of the area
- **Economy**: increase the local economy
- **Sustainability**: benefit from local resources

How?

- **Finding land**: municipality, donators, acquisition of the land;
- **Inviting Volunteers:** local population involved in the management of the land
- **Creating educational programmes**: students, adults, farmers
- **Promoting the production of:** Olive, Oil of aromatic plant, Olive Oil, aromatic plant cultivation, handmade soap;
- **Marketing**: website, newsletter, promo-material, e-mail list of association of organic farmers, labels

How?

Funding

Direct

- Products
- Annual membership fee for student (symbolic)
- Fee for farmers and tourists

Indirect

- EU Fund: Rural development program
- UNEP: United Nation Environmental Program
- UNDP: United Nation Developing Program
- *IFOAM*
- *FAO*
- *ICROFS*
- Goverments (Ministries, Local Authorities, Municipalities)

Who?

Education & training

Students: primary, secondary schools, under-and post-graduates

Adults: locals, volunteers, teachers, tourists

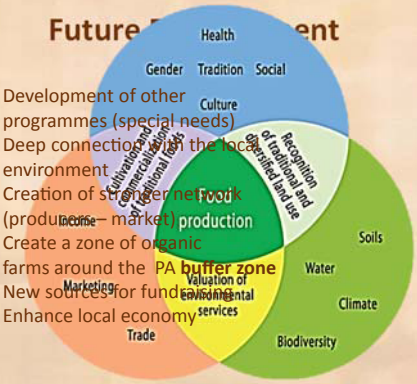
Farmers: at a local and national level

Unemployed: of all ages

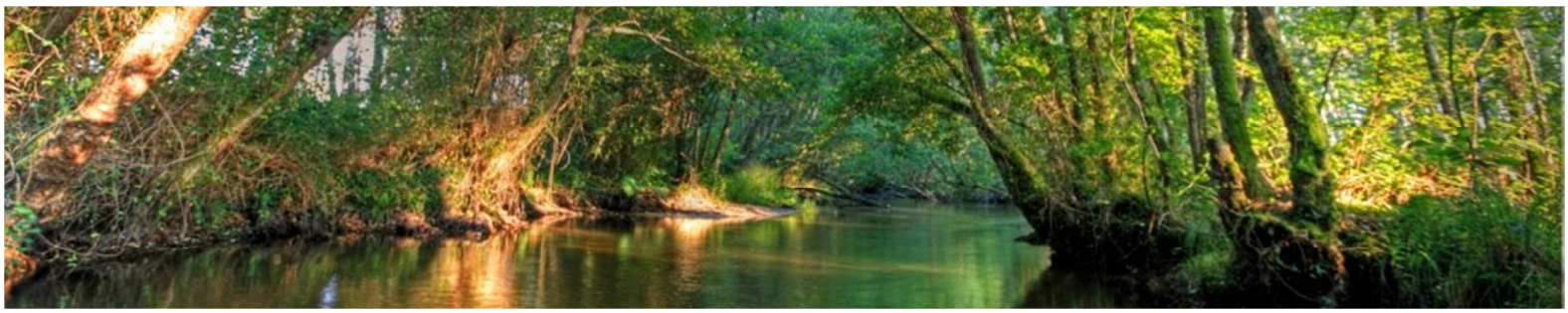
- **Theoritical part**: e-learning lectures books
- **Practical part:** botanic garden local farms field work at PA study tours

Future [illegible]ent

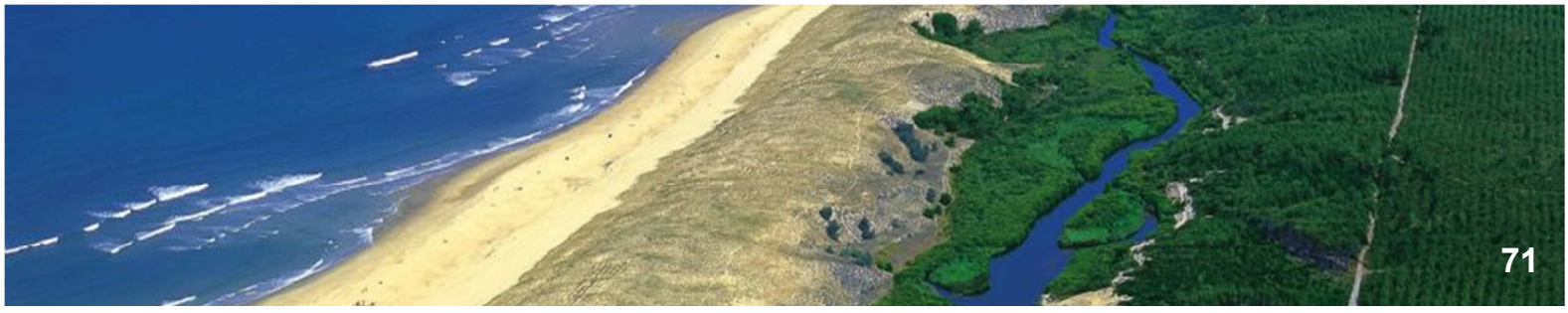
- Development of other programmes (special needs)
- Deep connection with the local environment
- Creation of stronger network (producers – market)
- Create a zone of organic farms around the PA **buffer zone**
- New sources for funding
- Enhance local economy



Setting up an ESD center in the village of Leon (France)



Daria Juretic
Elissavet Kourakou
Buket Senoglu
Alice Vidal



INTRODUCTION

In this essay we are going to present an idea to establish a Centre for Education for Sustainable Development (ESD centre) of National nature reserve Courant d'Huchet situated in France to improve education on SD, since it is already introduced in the school curriculum in France (A Resource Book for ESD Educators, 2013).

Education for Sustainable Development (ESD) processes emphasize the need for stimulating a holistic, integrated and interdisciplinary approach to developing the knowledge and skills needed for a sustainable future as well as changes in values, behaviour, and lifestyles.

According to UNESCO, ESD is about learning to:

- respect, value and preserve the achievements of the past;
- appreciate the wonders and the peoples of the Earth;
- live in a world where all people have sufficient food for a healthy and productive life;
- assess, care for and restore the state of our Planet;
- create and enjoy a better, safer, more just world;
- be caring citizens who exercise their rights and responsibilities locally, nationally and globally.

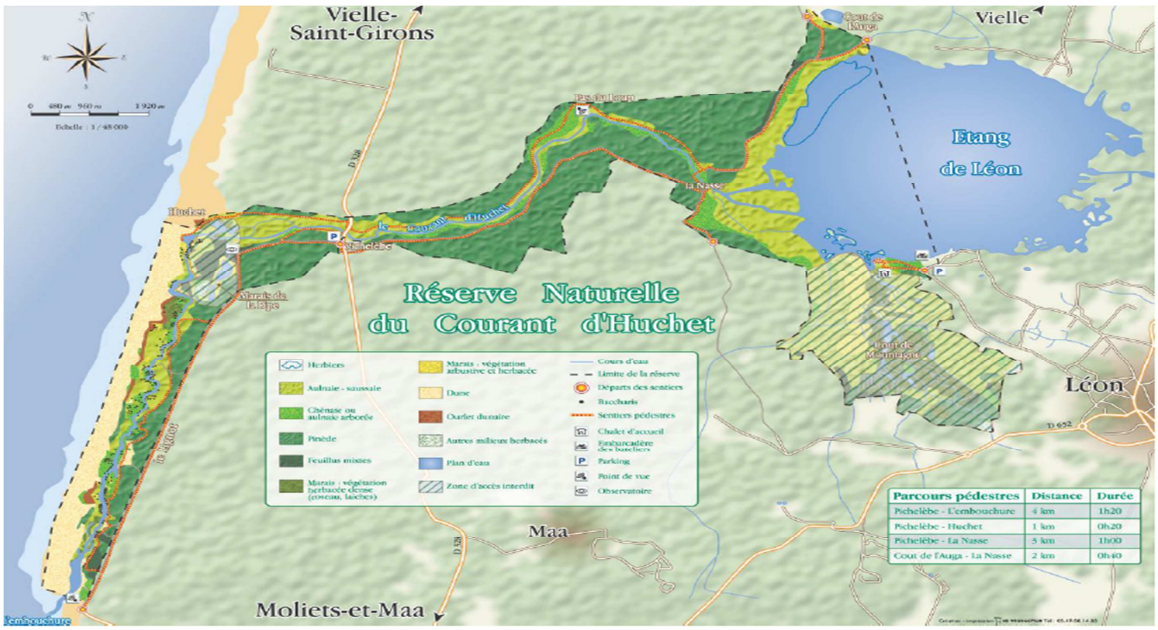
Therefore, the ESD centre should promote the transition to sustainable ways of living and a global society, including respect and care for the community of life, ecological integrity, human rights, respect for diversity, economic justice, democracy and a culture of peace, with a special focus on educational needs.

Necessary prerequisite is the provision of the place, where participants should be able to experience nature, culture and other aspects of human environment in order to stimulate interdisciplinary and holistic views. Also experiencing the area with certain problem may trigger critical thinking and problem solving ideas.

While we were trying to find the best localization for the ESD centre, we were looking for a place close to the protected area to provide a view on a great value and fragility of nature and its biodiversity, but also with a cultural heritage to emphasize a need for coexistence with a nature.

During the process we chose the area of the natural reserve Current d'Huchet, in France, Aquitaine region, department of Landes. It's located between the lake of Leon and the coast of Atlantic ocean, which constitute a rich area on history, traditions and habitats for flora and fauna. The natural reserve is a wetland resulting from the blocking and from the accumulation of continental waters which cause the dune corridor. The current is 9

kilometres long. Actually, the area is a reduced space where there are fresh and brackish water, dry or flooded grounds and therefore, which involve a high number of animal and



plant species. In this area, we can distinguish six main ecological units: Leon's lake, a fast water current, the forest (aulnaie - saussaie - oak grove), swamps and peat bogs, forest of maritime pines, the littoral dune.

The value of this area was noticed in 1934, when the current of Huchet and its banks were classified among the natural monuments and the sites of artistic, historic, scientific, legendary or picturesque character. In 1977, a part of the current has been pronounce "hunting and wildlife reserve". Finally, in 1982, the current of Huchet became a natural reserve thanks to the goodwill to preserve a unique site of a botanical wealth by limiting the human activities as well as an excess of tourist attraction on the current. The surface of the protected area is 618 hectares, and includes three communes: Léon, Moliets-et-maà and

Vielles-saint-Girons. 50 % of the area belongs to the local authorities, 27 % to the State administered property and 23 % to private owners. The area is important for tourism; so many activities are developed into or around the reserve.

The management body of the reserve is "Association of communes of Development and Management of the natural reserve of the current of Huchet", assisted by a consultative committee (three municipalities, owners, users, the General Council of Landes, associations of nature conservation and scientific personalities.

As mentioned before, area is rich in biodiversity. Concerning the animal species, it is one of the major sites for the European mink, also represent habitat for European otters, amphibious voles and various bats. Reserve presents a great ornithological value, in total 258 species of birds have been recorded. A Frog population is abnormally low, probably because of predators such as American crayfish, black bass, etc. In general, the entomological diversity is rich for this kind of environment. A total of 270 species were counted, with a clear dominance of beetles. About flora, 22 species present a major patrimonial interest, 10 species are protected nationally and 12 regionally.

We were looking for a location to be close to the protected area and we found it in the city centre of Léon. Proposed location is municipal, traditional architecture house, used before as a library and at the moment abandoned. This location could be ideal for establishing an ESD centre due to the fact that on the park territory, on a relatively small area you may find different types of ecosystems, settlements, and different sectors of the local economy. The features mentioned above may help future Centre educators to figure a concept of interconnectivity between different areas which is one of the basics to understand sustainable development ideas. Also such an establishment may represent improvement for local community, may attract a larger number of visitors due to the fact that it may represent a way of advertisement of the area.

Goal of the ESD centre is to provide a non-formal education including a field experience in the area of National nature reserve Courant d'Huchet for citizens from the Aquitaine region and beyond. In this work, we will focus on developing a one day program for elementary school kids, using all available resources that the area can provide to improve and enhance their understanding of sustainable development concept, including experiencing the area with its peculiarities.

Taking into consideration the steps of planning an ESD centre:

•Prepare a basic project and present it to local authorities and Courant d'Huchet management body

•In collaboration with local authorities and Courant d'Huchet management body find a location of the centre

•Elaborate a project of an ESD centre of Leon (detailed)

•Compete for funding at Ministry of Ecology, Sustainable Development and Energy; Ministry of National Education, Youth, and Sport and The Regional Council of Aquitaine sub-department for Research, Education and Technology Transfer

our objectives are to nvestigate the possibilities, evaluate the results and recommend actions, concerning the establishment and the function of the ESD center.

METHODOLOGY

Our cooperative learning model was the group development model **Forming- Storming – Norming – Performing** (Tuchman, 1965). During the Forming phase we tried to select the most appropriate theme for our group's member synthesis. We agreed on preparing a short essay for setting up an ESD center for a protected area because we believed that every member of the group could be really engaged in and contribute to this essay. At this point we were mostly focused on arranging our meetings' plans. Storming was a phase that we really confronted each other and each other's ideas also. Although sometimes this became unpleasant, the great thing about it is that we shared the same perspectives. That's why it was easy for us to design the main plan of our work. Our team supervisor was as less as possible directive in his guidance for expected group behavior. We practiced the **SWOT Analysis** (Strengths, Weaknesses, Opportunities, Threats). We used the **technique of brainstorming** and we consulted the concept map that reflects the design of an ESD intervention in a MAB BR or a DA (A Resource Book for ESD Educators, 2013). Furthermore we made the first attempt to distribute our teamwork. Considering the strict timetable of our session's program, we managed to reach to some point the Norming phase mainly by trying to adjust our behavior to each other. We didn't mamage to get to the **Performing** phase.

Our most important tools were: **literature review** (of our resource book, pedagogical articles and books), **webpage review** of official site of the protected area and the social website trip advisor, **observation** of the geophysical characteristics, hydrographic network as well as on the location of the touristic, industrial and agricultural facilities of the surrounding area where the National Nature Reserve is situated, **interviews** that took place during our accommodation in the ESD center facilities, with Mr Vassilis Psallidas, consultant for the EE and the ESD, Mr George Kottis, educator of the ESD center of Amfissa and Alice Vidal, citizen of Leon and biochemist specializing in ecotoxicology. We wanted to be informed about the structure of our essay, the objectives, guiding principles, pedagogical approaches and methodology that can be adopted by an ESD center and the environmental impact of the touristic, industrial and agricultural activities in the vicinity of Leon's lake.

RESULTS

Given time constrains, we decided to focus on locally relevant objectives of an ESD center.. One member of our group, Alice Vidal, lives in the village of Leon so we already had enough reliable information and sincere motivation. These objectives are:

- To highight the special characteristics of the region
- To show the local problems and how to adress them
- To present the local, natural and cultural wealth, aiming to raise awareness of students and citizens as they will move in the direction of protection and rational management.
- To provide learners/visitors with pleasant experiences, which increase their belief in their potential to bring a change towards the region's sustainable development and their willingness to participate in similar projects
- To stimulate and develop the positive attitudes towards the foundation and sustainable management of the protected area

The prerequisites concerning the establishment as well as the function and the educators of an ESD center were determined taking the analysis and evaluation of the objectives above intio account and they are:

In order to make our recommendations, our main lodestar was the observation of the

geophysical characteristics, hydrographic network as well as on the location of the touristic, industrial and agricultural facilities of the surrounding area where the National Nature

Reserve is situated. Effluent and waste from touristic, industrial and agricultural activities in the vicinity of the lake flow into the lake and have no escape route because of the landscape structure. The flow from the lake to the Atlantic is not consistent and depends on the ocean weather and currents. There is also a possibility that waste comes in from the ocean onto the shore.

Citizen's (Alice Vidal) statements as well as the comments of Trip Advisor' s (social website) comments do verify the presence of enormous amount of waste onto the shore.

RECOMMENDATTIONS

Concerning ESD center's objectives we recommend:

- Field visits to the National Nature Reserve exposing the vast biodiversity of species as there are six main ecological units in the Reserve.
- Ecological farming programs designed for smallholder farmers
- Seminars for the touristic business about sustainable management
- Action oriented interventions throughout the year focusing on waste containment and disposal
- Proposals about the waste processing for the local community and industry
- Educational materials and learning media such as posters, booklets, brochures, magazines
- Practical action and learner oriented educational ,methods such as the one that will follow later

Concerning specific prerequisites of the ESD center of Leon, we recommend

- The provision of a place adjacent to the protected area and accessible for handicapped
- Cooperation with scientists, relevant stakeholder bodies and participation of the local community in program implementation
- Partnership with national scientific institutions, municipality authorithies and local associations
- Educators widely educated with basic ecological and pedagogical knowledge and special knowledge on ESD

Bariing in mind that Within ESD the role of the educator is very distinct and important for the success of any educational programme we would like to emphasize the educator's specific skills.

In protected areas in particular, the educator must have the skills of a tour guide who, within a relatively short period of time, is required to help visitors to “interpret” the natural environment, to stimulate reflection on complex concepts such as ecosystems functioning, biodiversity protection, sustainable management, while giving information about the areas’ natural and cultural feature. Communication, negotiation and persuasion skills together with effectiveness are very important, in order to gain respect and consent to the behavioral safety rules when needed.

Last but not least an ESD educator needs to have a good knowledge of the functions of a Biosphere Reserve, namely: conservation: landscape, ecosystem services, species, etc; development: economic and human activities, and those who practice them (i.e. organic farming, adapted forest management, ecotourism, handicrafts, traditional and cultural festivals); logistic: the research and monitoring taking place for the area, campaigns, etc. as well as the management plan and the risks that the BR is threatened by.

In addition to having basic ecological and pedagogical knowledge, an ESD educator must also have special knowledge on MAB/BRs and international conventions, special knowledge on cultural heritage, special knowledge and competences for persons with disabilities.

The ESD centre of Leon will promote the planning of educational program, which refers to the activities for learners through games and field visits to embrace the principles of ESD and put them into practice. We found that the best time of the year for the proposed activities will be spring and early summer as well as autumn period. At those time of the year student may observe the change of the nature, awakening period in the spring, early summer with flowering meadows and the rich autumn period when they may enjoy local fruits and the huge pallet of autumn colors in the forest. Also this period is convenient/acceptable to the local community, because it’s not touristic high season.

Previous the visit, in the classroom, student will be given some information about the region, to build an idea of the region, to encourage curiosity, to prepare. Student may also require some practical information’s because for the trip they need walking shoes etc. but also they have to learn how to behave in the nature, particularly in a protected area.

The planed education is one day trip and comprises from different activities in various locations in the Natural reserve of the Courant d’Huchet, (ocean’s coast, forest and lake), which enables students to link the scientific knowledge brought from the school to the different natural environments.

Proposed one day program is planned to start at 9 am with students arrival to the center. At the centre they will have a brief introduction about the Natural reserve of the Courant d’Huchet. Educators will prepare them for the field visits in order to enhance their ability of perception and understanding the interactions between the natural, cultural, and economic environment. Than educators will start a preparation for the first educational stop/spot, at the beach. The first step is to locate the coat area on the map and discussion about human impact on the area. They will show them pictures about different kind of potential wastes. Also, they will discuss about the future activities.

At 10, a bus will pick up the group up to go to the beach, to the part of the coast under the protection of the natural reserve. The first proposed activity is: cleaning the sand, collecting different type of materials (wood, plastic, styrofoam, fabric waste) that can be found on the coast. Kids will be divided into five groups and each group will have a different kind of waste to collect (wood, plastic containers, plastic bags, fabric, styrofoam & metal…). Every group will have a worksheet; abut beach pollution - connected with their task. The duration of the beach spot activity is one hour.

The aim of this activity is to raise the awareness of an amount and diversity of waste that can be found in the nature. To think about the origin of the waste, what can be done to avoid the pollution of the nature with solid waste, so they can realize what the consequences of uncontrolled waste disposal are. Also during the discussion on the coast, educator will induce kids to think about possible threats of the waste for the environment, for example birds, fishes.

Before the activity, educators will examine the possibilities of the area. The planned area is managed in order to reassure children won't get hurt while collecting objects. It's essential because some dangerous rubbish may be found (syringe, glass, scissors…) After the activity, kids will be back to the center, by bus, approximately 11:15. There is planned to concede with a discussion appraising the findings of the field visit.

Also the first evaluation is planned, the one about the changes of student's behavior about pollution, i.e. what they have learned within field visit. To evaluate students we use a web chart on "ocean's pollution".

At 12 it will be lunch time, on the terrace of the centre. A lunch menu will be composed from some local products, to initiate them to customs. The menu is composed of starters (bread with different pâté), main dish (duck accompanied of french fries) and local desert which is a traditional cake (Pastis landais).

After lunch, a visit in the old traditional centre of Leon is planned. It is planned in form of a short walk during which they will be introduced to the local architecture, usage of traditional materials.

At 13:30, some activities in the centre are programmed such as a movie about the history of the natural reserve, a map of this area to place them, and pictures about threatened species on the natural reserve.

Before the departure, to each group will be given cards (with pictures of the species that can be found in the forest) for the forest activity. At 15, kids will departure from the centre to the forest adventure, where a botanist/biologists will join the group to enrich the experience. The Forest activity consists of a circular short walk through the forest with one stop point, and it is going to last an hour. During the walk through the forest, kids will be encouraged to seek for species on their cards, which some of them are endangered.

A special activity is planned to show to the kids an old, almost forgotten job: “gemmage”.

This activity will be presented by a volunteer or a centre employ, who will show them how the resin was collected (special tools and technique) and tell them the story about various usages of resin and value for the local economy in the past. Aim of this activity is that kids r realize the importance of the richness of the environment, and the dependence of the man on the environment.

After the forest walk, at 16, they will discover the small Museum of the natural reserve of the Courant d’Huchet. It’s a recent greenhouse in wood showing some explanations about the old traditions and also the biodiversity of this natural reserve. They will be spoken about the greenhouse concept, afterwards they will be asked to give some ideas of improvement of their school to become more environmental friendly building. The aim of this exercise is that kids realize that even a small change in their habit or behavior may be beneficial for the environment.

Then at 16:30-17:00, student will be asked to group in their groups .Every pupil will receive life vests, they will be given safety instructions and prepare to embark in “barques”, local small boats. During the trip they will be able to observe the nature from another perspective, and just enjoy the area. Also, the guide will present them specific plants and animals for the area, in an amusing way, trough fables and stories. The “barques” trip will end on the shore where the bus will pick up the class and take them to the center for final activity.

Scheduled time for the return at the centre is 18. The last activity is about to make a class poster, where kids will be able to write their names, impressions, messages, ideas etc. To finish the day, they will have another 5 minute evaluation, completing the worksheet from this morning, to know what they have learned. Also for the class teachers, Center guide will propose a short plan for next day to repeat with kids what they saw, what they learned

A herbarium with plants that they have collected in the forest, illustrating the ecosystem Also, educators will highlight the major role of the biodiversity explaining some ecological functions in the ecosystem.

Literature, Webpage Review

Education for Sustainable Development in Biospheres Reserves and other Designated Areas: A Resource Book for Educators in South-Eastern Europe and the Mediterranean", UNESCO 2013

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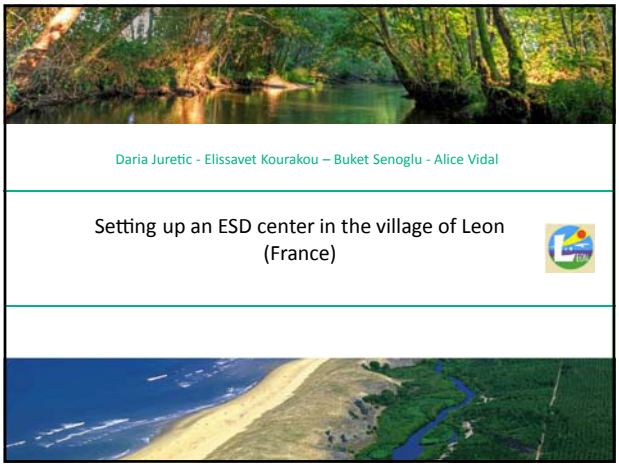
ΚΠΕ ΑΜΦΙΣΣΑΣ

http://www.tripadvisor.com.gr/Tourism-g1079338-Leon_Landes_Aquitaine-Vacations.html

Power Point Presentation Handouts



Daria Juretic - Elissavet Kourakou – Buket Senoglu - Alice Vidal

Setting up an ESD center in the village of Leon (France)

INTRODUCTION

- Establishment of a Centre for Education for Sustainable Development in France
- Location close to the protected area, rich in biodiversity and cultural heritage
- Natural reserve of the Courant d'Huchet and the village of Léon

- OBJECTIVES : Investigate the possibilities, evaluate the results and recommend actions, concerning the establishment and the function of the ESD center

TOOLS & RECOMMENDATIO

- Adaptation of this program to different level of learners
- Educational program for formal schools, NGOs, local business and community

OVERALL CONCLUSION

- Necessity of an ESD center in the village of Leon
- Sensibilisation of the community
- Support of the ESD in formal and non-formal education by creating alternative education courses as well as materials
- Enhancement of the relationship with the local community

THANK YOU FOR YOUR ATTENTION

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1. INTRODUCTION

In the last years ecological problems related to water consumption, human activities, pollution, resource exploitation, growing population are becoming more and more important both for scientists and for the public. At the same time we are witnessing a strong change in people's ecological awareness especially from 1960 when several studies started to develop in order to answer important questions. As we can understand, there was and there is still a need to educate people and at the same time we need to increase the local community participation in order to involve them. In this way we can form the attitude necessary for people to participate in a responsible, effective and sustainable way in the decision making process related to environmental problems trying to change the mind toward a sustainable community developmen
But what does it mean Sustainable Community and how we can relate this concept with the ESD center?

1.1. ESD and ESD-Centers as a Tools for Sustainable Community

A sustainable community is a community that looks not only in to the present but and in to the future. It is flexible enough, and wise to maintain its natural, economic, social, cultural and political support systems.
A sustainable community continues to thrive in time because it has:

- A healthy and diverse ecological system that continually performs life sustaining functions and provides other resources for humans and other species
- A social foundation that provides for the health of all community members, respects cultural diversity, is equitable in its actions, and considers the needs of future generations
- A healthy and diverse economy that adapts to change, provides long-term security to residents, and recognizes social and ecological limits.

Taking into account what we said above, we have to analyze the possible solutions that we need to apply in order to achieve both participation and sustainability. According UNESCO:
"The kind of change required by sustainability implicates each community, each household and each individual. Successful solutions to problems at this level of society will need to be rooted in the cultural specificity of the town or region if the

people are to be supportive of and involved in such change." From the UNESCO (1997) *Educating for a Sustainable Future: A Transdisciplinary Vision for Concerted Action*, paragraph 114.

Education for sustainable development (ESD) means including key sustainable development issues into teaching and learning, such as poverty alleviation, citizenship, peace, ethics, responsibility in local and global contexts, democracy and governance, justice, security, human rights, health, gender equity, cultural diversity, rural and urban development, economy, production and consumption patterns, corporate responsibility, environmental protection, natural resource management and biological and landscape diversity.
It also requires participatory teaching and learning methods that motivate and empower learners to change their behavior and take action for sustainable development. Education for Sustainable Development consequently promotes competencies like critical thinking, imagining future scenarios and making decisions in a collaborative way.

During the last years the importance of education for sustainable development centers (ESD-Centers) became stronger enough to involve not only the young generations such as children and students, but also the local communities and the society in general, local or global. The main aim of an ESD-Center is to succeed in making individuals and communities understand the complex interactions between them and the nature taking into account all the aspects such as social, economic, cultural, environmental, institutional and technological. This way, we will be able to increase the awareness of learners towards sustainable development but at the same time they will increase their knowledge, their attitudes and skills in order to change their mind toward a sustainable future.
To achieve a sustainable future we have to make people aware of what is happening, where they live and what they can do. The participation process seems to be the best way to reach this aim. In the paragraph below we are going to explain the importance of the participation process taking into account the main principles and the main step that need to be followed.

1.2. PARTICIPATION PRINCIPLES

As we can understand the public participation in making decisions is vital, moreover the local participation can lead to better decisions in order to meet the needs of more people. Decisions are more likely to withstand scrutiny if the decision-making process is more open, more honest and more accountable. At the same time, we must say that public participation does not guarantee that everyone will be happy with a decision. But involving the public at an early stage in the decision-making process, and finding ways for their views to be heard and taken into account, helps to build consensus. Another important point is the improvement of the democracy. Infact regular public participation shows people that they are valued and that their views are important. In

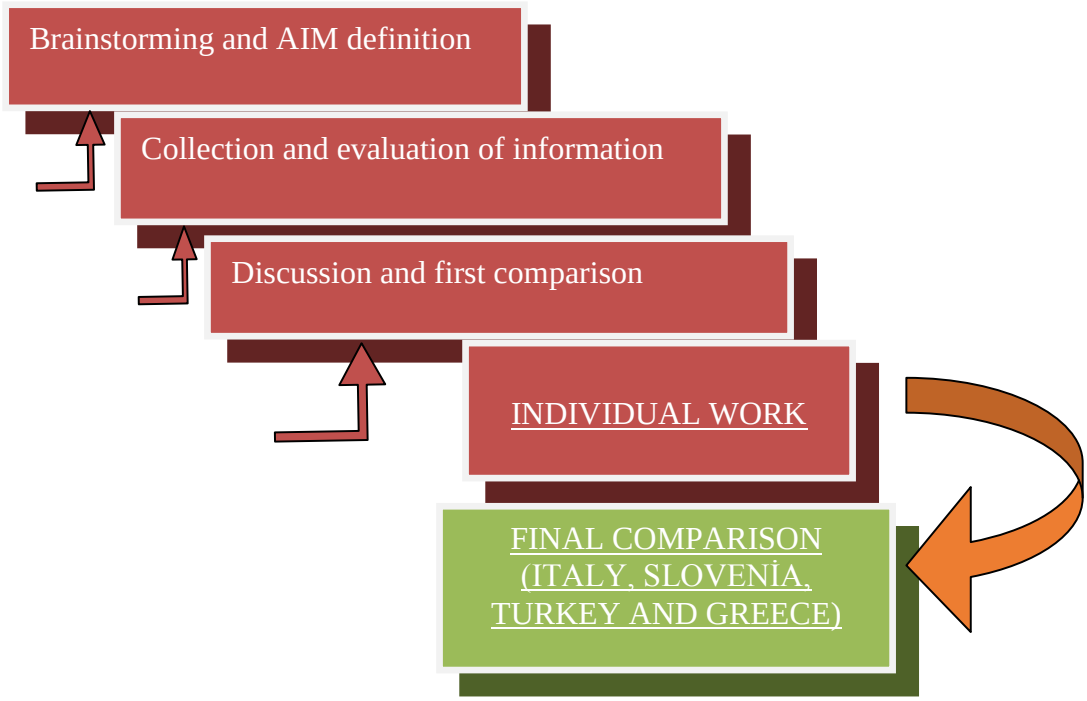
this way, individuals and community groups can become more active and more responsible for their environment and quality of life.
The first thing that needs to be done is to prepare the public participation process using certain questions, strategies or plans previously agreed.
The second step is to create a participation strategy. To create a participation strategy we need to answer to the following questions:

- what is the purpose?
- who should participate?
- are the public represented?
- how will we make sure all of the public is represented?
- how will we persuade and get the public to participate?
- when should they participate?
- what information do they need to participate?
- how long should be allocated to the public participation stage?
- what do the public need to participate?
- what resources are available?
- how long will the public need to make their comments?
- how will the comments be handled?
- what needs to be done once the decision has been made?

The aim of this study is to assess current situation of the level of local participation in ESD-Centers from four countries Italy, Turkey, Slovenia and Greece trying to compare them in order to recognize advantages and disadvantages from every country in order to define the best ways to increase the involvement of local participation.

2. MATERIAL & METHODOLOGY

In this chapter we are going to discuss which kind of material and methodologies we applied in order to achieve our aim. The web research represents the most important resource of information that we used to delineate the main guidelines of our essay and to analyze the existing situation. We analyzed official web pages of ministries and of the most important institutions. We used several scientific articles, documents and other materials available inside the environmental center in order to have a broad view of the situation. We interviewed the employees from the national park of Parnassos and from the environmental center of Amfissa in order to collect more information about the possible solution in involving local communities. Anyway the material that we used and the time we had, it was not enough to analyze in a better way our topic. Moreover some interviews to the local community should be done in order to improve our research activity.



The methodology that we followed was the first thing decided in order to have a clear way of working. The first thing that we did it was a brainstorming in order to delineate the general structure of our work. After that we defined the aim of our research, in this way it was possible to collect in a easily way all the information from different sources of data to reach the fixed aim. All together we had a first general checking of the collected information and we divided the work in order to manage in the best way the time we had. From this moment we had an individual work but taking always into account the work situation of the other team components. In fact during these days several discussion and comparison were conducted among us in order to have always under control the work between us. At the end we joined together the different individual parts in order to compare all the information and to delineate the main conclusions and the main suggestions.

3. RESULTS

3.1 GREECE

The Greek Ministry of Education states that the ESD-Centers aim to emphasize the importance of having the entire local community participating in assessing, exploring and tackling an environmental problem. Furthermore, in addition to understanding the

social nature of environmental problems, it states that the experience and knowledge of the local people should be utilized in order to find a solution to a local environmental problem. As in contrast to the stated aims of educators where there is no direct reference to the local society but merely a general statement of the need to have everybody environmentally literate. We can report that in Greece the participation of the stakeholders and the local community in and with the ESD-Centers is generally limited to one or two day seminars. Although, we should highlight four centers that are combining activities to expose local products within the ESD-Centers and give the opportunity to the producer to argue for the quality of their products and the environment friendly process for production. Those centers are CEE Mallaon and Amfissa and MAB Olympus and Samaria.

3.2 ITALY

The first thing that we must clarify in the Italian context, is that we don't have clear guidelines in involving local communities in a sustainable development even if in the Italian constitution the involvement of people plays a relevant role. As we have already said this leads to several problems related to the decision making process. Anyway we were able to extract some general rules. Before explain this point, we have to say that the environmental education in Italy is entrusted to specific bodies responsible for environmental protection that can be either institutional such as the Ministry for the Environment, Land and Sea or associations or non-governmental organizations. This means that we can find few environmental education centers under the state control. In general EC are situated near specific places with high values due to environmental and cultural importance. In Italy the education about a sustainable development is addressed inside programmes applied by the different subjects involved in the environmental education and we cannot find specific ESD centers. Moreover we can recognize a complete lack in an education to a sustainable development during the mandatory schooling. In the Italian context, the involvement of local communities seems to be very uncommon, especially when we are facing with environmental and sustainable development issues. As we have already said, we can recognize thousands of different association, non governmental organization, national agency, trying to involve people in the decision making process. The most important ones together with the Ministry of Education, the Ministry of Environment and some other important national and regional institutions are responsible for

different programmes in order to "preserve nature starting from the protection of nature, to educate young people to respect the world in which we live, raise public awareness on issues important as the protection of the environment and the attention to health ... "

In conclusion for the Italian context we are able to recognize not only indication on the way of the participation process but archives of information about the environmental sustainable education on different themes according the general guidelines from the Italian Ministry of Education. So in the Italian context, the local community involvement is achieved thanks to different solution that can be applied in an integrated way.

3.3 SLOVENIA

Slovenia does not have ESD centers, but we have environmental centers. The environmental center is organized as a place that offers conditions for the operation of environmental NGOs, linking the interested public, while enables the general public to access information and publications on environmental protection and sustainable development.

Main objectives of our centers:

- improve information and public awareness of environmental protection and sustainable development,
- enhance the environmental awareness of individuals and community,
- improve the participation between environmental NGOs and the public in decision-making processes,
- improve public access to environmental information and publications,
- provide basic advice and access to independent advice in various fields of environmental protection and sustainable development.

We couldn’t find any official statement of the management and strategy of Slovenia (by the Ministry of Education and Sport) for the participation of the local community in or with the environmental centers. In Slovenia Education for Sustainable Development includes (by the Ministry of Education and Sport):

- respect for human values
- active citizenship and participation
- intercultural dialogue and linguistic diversity

- nature conservation and environmental protection (environmental awareness and responsibility)
- quality education an inspiring working and learning environment
- quality of interpersonal relationships the development of social skills (non violence, tolerance, cooperation, respect, etc..)
- A healthy lifestyle (mental and physical health)
- Strengthening healthy self-confidence and self-esteem,
- Quality leisure time
- Developing entrepreneurship as a contribution to society and the environment,
- Learn about different areas of culture and the promotion of creativity and activity.

3.4 TURKEY

Education for Sustainable Development programme is operated not only by official organizations but also by volunteer organizations in Turkey. This programme supported by local foundations, regional foundations, Ministry of Education and some International Programmes. In addition to Our constitution deal with environmental sustainable development and the law of environment's aim is that, the environment which is the lebensraum of all organism, have been to protected by sense of sustainable environment and sustainable development.

In Turkey also more than 47 volunteer organizations are working about sustainable environmental development both regional and local level (Duru, 1995). The most recognised of them are Foundation for to Compete with Erosion, Planting and Protect Natural Asset in Turkey (Türkiye Erozyonla Mücadele Ağaçlandirma ve Doğal Varlıkları Koruma Vakfı-TEMA), The Foundation for Protect Wildlife (Yaban Hayatı Koruma Vakfı), The Foundation for Protect and Recognise the Environmental and Cultural Values (Çevre ve Kültür Değerlerini Koruma ve Tanıtma Vakfı-ÇEKÜL), Association of Nature (Doğa Derneği), etc. Especially, Ministry of Education organized EDS for students who are in pre-school to highschool. This education organized in 81 cities of Turkey by name Project for Practical Environment Education. For university students ESD programme organized by each university's administration which is interesting in environment (Kaya et al., 2010).

According to Kaya et al (2010), Turkey doesn't have a national strategy in the coordination of Ministry of Environment and Forestry, Ministry of National Education and State Planning Organization that share the responsibility of the process

with the aim of preparing our national strategy. It is defined that there isn't enough pressed and visual education materials in the subject of Sustainable Development for the purpose of being kept informed and become conscious of the society. But, UNESCO National Comission for Turkey (2012) according that, Ministry of Education, Ministry of Environment and Forestry and State Planning Organization have been supported the EDS. Also UNESCO National Commission for Turkey constitude a department to monitor to techniques and politics issues of EDS. The example of this is the eco-education/eco-school which trained by a foundation named TÜRÇEV.

4. CONCLUSION

The main problems that arise from our study are:

- In some countries (Italy, Slovenia and Turkey) there are no common institutions able to give common guidelines about environmental education but in Italy we can recognize some environmental center that are not related with a sustainable development
- A weakness in the involvement in the participation of local communities

Analyzing the different results of our research we can say that we cannot recognize big differences among the studied countries. In particular we can say that the Italian and Turkish situations seem to be similar. In these two countries the local communities involvement on the environmental sustainable education seems to be unclear and very fragmented without common guidelines. Our proposal is to define

common guidelines about the participation, decreasing the number of the different institutions in order to have a clear structure both in the Italian and Turkish society.
Slovenian situation is something in the middle. In this country the education for sustainable development is a central part in the education process but at the same time the lack of ESD centers leads to some important consequences such as the bad connection within local community and educational centers for sustainable development. So in this case, we need an increase in the links between local community and environmental centers, we also need to start with a process of upgrading and with introduction of new ESD centers, trying in this way to increase the participation of local community in the decision making process about the environmental sustainable development.

The Greek situation seems to be the best one among the studied countries. In fact we can recognize a well distributed structure all over Greece of ESD centers with clear guidelines. Although we couldn't find a precise strategy of Greece (by the Ministry of Education) for the participation of the local community in or with the educational centers of sustainable development.

Suggestion

According to this situation of the countries we can suggest to apply strategies and programmes in order to increase the participation of local communities. Our suggestions are:

- Involving the local communities in actions in summer or winter camps as volunteers to participate within the working groups in order to provide communication with locals and to get in touch and interact with each other.
- Esd centers should support programmes to educate local producers (organic farms, tourism, environmental friendly)
- Periodical newspapers, open days for interested public
- Certification system for each facilities in the region (green building, eco-school…) joint together in the same institution
- Create specific compulsory programmes to follow about environmental sustainable development in the school environment
- Festivals to improve the awareness about local products and local resources

Finally, we believe that each ESD-Center should develop and apply a strategy under the mentioned.

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Power Point Presentation Handouts

ERASMUS Intensive Program
on Education for Sustainable Development (ESD) in Protected Areas

Education centers for sustainable development and local participation

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July 2014, Amfissa, Greece

1 of 6

Introduction

- ESD
- Public Participation
- Participation Principles
- Aim

Education centers for SD and local participation

2 of 6

Material & Methodology

Brainstorming and **AIM definition**

Collection and evaluation of information

Discussions and first comparison

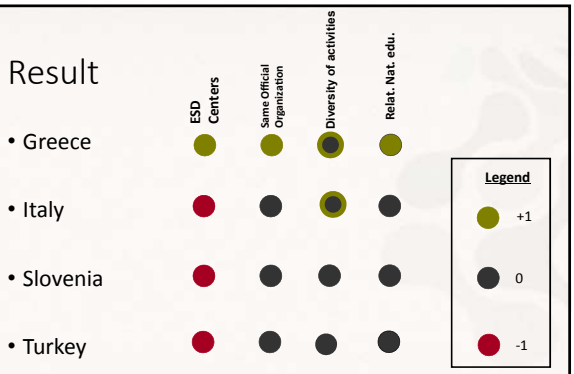
Individual work

Final comparison
(Italy, Slovenia, Turkey and Greece)

Education centers for SD and local participation

3 of 6

Result



Education centers for SD and local participation

4 of 6

Conclusions

- No national guidelines for ESD
  - fragmentation
- EEC but no ECSD
- Moderate participation
  - seminars
  - local products

Sustainable Communities

Suggestions

- Local volunteers in camps,
- Educating and give advice,
- Certification system of good practices,
- Voluntary programs for environment enthusiasts,
- Local festivals,
- Newspaper and open doors days.

National strategies for sustainable communities

Education centers for SD and local participation

5 of 6

Dinlediğiniz için teşekkür ederiz

Ευχαριστούμε για την προσοχή σας

Thank you for your attention

Hvala za vašo pozornost

Grazie per la vostra attenzione

Education centers for SD and local participation

6 of 6

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1. Introduction

Water is more than just a liquid chemical. Water is life.

The succeeding essay was written during the Summer School on Education for Sustainable Development in Protected Areas and Biosphere reserves in Amfissa, Phocis prefecture, Greece, from 6th to 19th of July 2014. In this essay a short study of water management in the area was undertaken by 5 colleagues from different backgrounds and countries. The scope of the essay is to shortly summarize water management of the Phocis prefecture and Parnassos national park with regards to water supply, irrigation, urban uses, the waste water issue, sewage treatment plants, etc., in the present and past with special regards to educational programs and awareness campaigns in place.

1.1. Water and water management

Water is essential to sustain and promote life. As a resource it has been considered invaluable for humans, settlements, economical activities and agriculture throughout history and demand for water has been increasing with growth of population and all other human activities. Today it is still the most important factor of prosperity. For a large part of the human population, it is heavily acquirable and scarce resource even with the enormous leap in technological advance of securing drinkable and usable water in the past century. Growing pressure on water resources – from population and economic growth, climate change, pollution, and other challenges – has major impacts on our social, economic, and environmental well-being.

Water management is an interdisciplinary field concerned with the management of water resources. Different topics fall under the umbrella of this field, from sewage treatment to wetlands restoration.

1.2. Phocis prefecture and Parnassos national park

Modern Phocis has an area of 2120 km² (819 mi²), of which 560 km² (216 mi²) are forested, 36 km² (14 mi²) are plains, and the remainder is mountainous. The massive ridge of Parnassus (2,459 m/8,068 ft), which traverses the heart of the country, divides it into two distinct portions. Much of the south and east are deforested and rocky and mountainous while the valley runs from Itea up to Amfissa. Forests and green spaces are to the west, the central part and the north. Its reservoir is the Mornos Dam on the Mornos River. It covers nearly 1 km to 3 km². With a population of 40,343 (2001), it is one of Greece's least populous regional units, and has a population density of 19 persons per km² (49/mi²). In the summer months, the population nearly doubles due to the influx of tourists. Most of the villages are in the south, the southeast and the east, especially in the areas between Amfissa and Itea. The north and the west are the least populated.

Parnassos Mt. consists of spectacular cliffs and rocky areas. Its geology is mostly hard limestone (76.6%). Limestone forms particularly impressive karst on Parnassus; some formations are nationally known, such as the Sinkhole of Lilaia and the Corycian Cave. The climate is humid, with an average annual precipitation of 1468,2 mm at an altitude of 1300 meters. Winters are particularly harsh and long lasting, while

summers are cool. Despite rainfall's intensity, surface runoff is low, due to the prevalence of permeable limestone, which justifies the large number of springs. Parnassos is a complex ecosystem, with a wide variety of landscapes and habitats, resulting to a rich and rare biodiversity. The protected area is characterized by a large number of special scientific importance and significance plant taxa. Regardless its natural - ecological value, Parnassos is a place of enormous cultural - historical heritage, i.e. the Sanctuary of Apollo and the Oracle of Delphi. In addition, the great cultural - historical value of the area is enhanced by the ancient and modern monuments, as well as the rich history of the region.

2. Methodology

Methods used for writing this paper include brainstorming, a group or individual creativity technique by which efforts are made to find a solution for a specific problem by gathering a list of ideas spontaneously. Ideas were discussed on how to develop the report, what to take into consideration and division of labour. After this we started to search for information utilizing different type of techniques and tools. Internet research is the practice of using information readily available on the Internet. We used also another, more traditional, source of information gathering that is library research. To integrate results of these types of approach we also tried to get in contact with local people, aware and able to give information about our topic. We interviewed the organizers and head of the centre. We define an interview as a conversation between two or more people where questions are asked by the interviewer to elicit facts or statements from the interview. Interviews are a standard part of journalism and media reporting, but are also employed in many other situations, including qualitative research.

3. Results

3.1. Past and present water management

In the past, water management in the area of Phocis was of the utmost importance and today there are multiple examples of different approaches to ensure an abundance of quality water for people, industry and agriculture. Through observation and information gathering we could find multiple examples of very complex, and thoughtfully planned management schemes of water management. One of the perfect examples of critical water management in the past can be found in Amfissa in the Harmina quarter. In that area there are several springs of fresh water that were used for the processes of leather production. Leather production in the area brought the city high income. After production, water was diverted to different parts of the city and used by the general public. This is an example of water management that we see today as well. After the introduction of more chemically dependant production techniques, leather production was mostly abandoned to preserve the water management system still used at that time by the general public, as well as because of the decrease of profit from the production. Water at the coastal part and the city of Kira, as well as most other places in the vicinity, was gathered using water tanks in the ground to preserve rain water for later use. The same

principle of water management for households can be seen all around the Mediterranean. The most important example of critical and innovative water management is the irrigation of olive oil trees in Amfissa. The plain between Amfissa and Kira is under the influence of sea water because of a low geographical profile. Sea can easily penetrate into the underground water and increase levels of ions in the ground. To prevent such practice, people would use an irrigation method of completely flooding the area, and in fact push the salty seawater away from the olive oil trees. Such practice led to formation of new subspecies in Amfissa and use and export of olives used mainly for human consumption and not production of olive oil.

3.2 Geography And Climate

The Itea - Amfissa valley divides the Mount Giona in the west from the Mount Parnassos to the east. This NNW-SSE oriented geomorphological depression is the result of an extensional detachment observed along the eastern slopes of Mt. Giona. This tectonic structure extends from the coastal area of Galaxidi at the northern margin of the Corinth basin to Prosilio village towards the north-Northwest at a distance of 25-30 km. Typical landscape in the area is karst, also an important aquifer type. Karst areas consist of solid but chemically soluble rock such as limestone (most important) and dolomite, but also gypsum, anhydrite and several other soluble rocks. Hundreds of millions of people worldwide live in karst areas and are supplied by drinking water from karst aquifers. These aquifers include valuable freshwater resources, but are sometimes difficult to exploit and are almost always vulnerable to contamination, due to their specific hydrogeologic properties. Therefore, karst aquifers require increased protection and application of specific hydrogeologic methods for their investigation.

3.2.1 Climate

In Amfissa, the climate is warm and temperate. In winter there is much more rainfall in Amfissa than in summer. According to Köppen and Geiger climate is classified as Csa. The average annual temperature in Amfissa is 16.7 °C. The average annual rainfall is 714 mm. The driest month is August with 10 mm. Most precipitation falls in December, with an average of 121 mm. The warmest month of the year is July with an average temperature of 26.2 °C. In January, the average temperature is 7.8 °C, the lowest average temperature of the whole year.

month	1	2	3	4	5	6	7	8	9	10	11	12
mm	98	85	68	53	38	30	14	10	32	77	88	121
°C	7.8	8.9	10.8	14.8	19	23.3	26.2	25.7	22.4	18.3	13.4	9.6
°C (min)	3.9	4.3	6	9.3	13.2	17.2	19.8	18.9	16.2	13	9.2	5.9
°C (max)	11.8	13.6	15.7	20.4	24.9	29.5	32.7	32.5	28.6	23.7	17.7	13.4
°F	46	48	51.4	58.6	66.2	73.9	79.2	78.3	72.3	64.9	56.1	49.3
°F (min)	39	39.7	42.8	48.7	55.8	63	67.6	66	61.2	55.4	48.6	42.6
°F (max)	53.2	56.5	60.3	68.7	76.8	85.1	90.9	90.5	83.5	74.7	63.9	56.1

Figure 1. Average temperatures in Amfissa throughout the year

3.3. Present water management

Within the Greek government the Ministry of Environment is in charge of water resources management and the Ministry of Interior is in charge of supervising municipalities which are responsible for providing water and sanitation services. The Ministry of Finance plays an important role in providing subsidies for investment. Water management in Phocis is left to the local government of the municipality. The local water Basin of Mondrose River is mainly used by EYDAP, a governmental company and production facility of fresh water for Athens. Mondrose dam collects high quality water from the region. Water is then transported to Athens via a canal. The canal is 200 km long and parts of it are open which leads to high losses of water due to evaporation and theft from local people who use it for irrigation of their fields and olives. Because of high availability of water, such threats are not well managed.
Amfissa water supply is also dependent on the canal as part of the water from Mondrose dam is converted to a local water treatment facility. The facility is not operated in a sustainable way and due to old age of the facility (it was built 30 years ago and not well managed in the meantime) only method of water treatment is addition of chlorine based not on analysis of incoming water but the “feeling” of the operator. Analysis of water quality is undertaken in Athens based on samples taken from the facility. The results are not widely circulated and remain, in a great extent, hidden to the general public. Such an approach, low information sharing, leads to insecurity of people using the potable water from the system and a high number of people using bottled water. Problems also arise from asbestos water pipes. They cause cancer and people are not willing to risk their health, also due to an abundance of bottled water of a relatively low cost.

High percentage of the population in the coastal settlements has private wells and water cisterns, although such water usage is found scarcely. Pumping water from wells is contributing to salting the fertile land in Amfissa plain due to rise of underground waters and introduction of water from sea to the underground water aquifers.

Sewage treatment plant exists in the area but not much information is available on its work and quality of the treated water. It was constructed some 20 years ago and the education of the people working in the plant is not adequate for today's level of complexity of water treatment. Primary and secondary treatment of sewage is undertaken. There is no analysis on discharge of water from the treatment plant into the sea. Sewage is not collected from the whole area and a large number of people in the region use septic tanks as a mean to collect sewage waters. Problems arise when they are constructed in areas that easily leak sewage into underground waters. Such practice can cause polluting of wells with pollutants from sewage waters in the area. Sewage water problems exist all over the region since no significant network of sewage pipes exist in the mountain area of Parnassos that is attractive for its winter sport resorts. Tourism in other parts of the region is not well developed and it could be a significant factor of sustainable development if it would be developed in a sustainable way. Unfortunately, we did not find a strategy of sustainable development of tourism in the area.

Other significant problem in the Parnassos national park and especially in the water reservoir of the Manrose dam is the ban on intensive farming and agriculture. Agricultural activities are a source of high pollution, but if best available technologies are used, no such problems arise. However, the national government imposed laws and regulations on the local people disabling their income structure and made the area not desirable to live in. Mountain areas are of low interest for investments in the beginning because of lower connections to other transportation means rather than roads. Mining industry is one of the feeding forces of the region and this is the second bauxite excavation site in the world. Bauxite is mined in the region and transported to other regions by ships to be processed. Problem with the mines is in destruction of landscape, runoff waters carrying heavy metals and no restoration of landscapes at abandoned sites. Open mines are used because of bauxite deposits near the surface of soil and the following low cost of such excavations. Mining operations are also in place for reaching deep deposits of bauxite. Open mines are a heavy impact on the landscape and their mitigation last for hundreds of years. There are possibilities of planting new soil and trees in those mines and such technologies were used in the past but did not yield good results because of low knowledge on the subject. Runoff waters from both open and underground mines are full of heavy metals polluting soil in the nearby area and making it unusable. Phocis prefecture lies on the sea side and has access to sea which gives the local people a great opportunity in using a valuable resource for cultivating maritime cultures, fishing, transport, tourism, etc. Most of these opportunities are realized to a great extent. Fishing is a traditional activity and shipbuilding in the area was a huge industry in the past times although today it mostly ceased in the area. Fishing is encountering today a problem of depleting the natural habitats of local species and as a result lower income. Similar problems occur on a global scale. Maritime production of certain species is also present and will probably represent the main way of fishing in the future. To control the quality of water there are 168 biological stations in the Corinthian Gulf. Again the same problem of lack of information on the quality of water is observed and not much is known on the subject. Tourist activities on the coast are scarce, as was mentioned earlier. The ESD centre in Amphissa is a regional centre and performs daily and multi-day student educational programs. The programs of ESD centre Amphissa are related to issues and knowledge of management of natural and anthropogenic local and wider environment and linked to national and global environmental problems. It is oriented towards the formulation and attempt to tackle environmental problems existent. Interdisciplinary approach is used and follows the new school curriculum (DEPS) and is adapted to the cognitive level of students (elementary - middle school - high school). There is some involvement of the school community and the local community. The mountains of Parnassos and Giona, the Corinthian Gulf, the grove of Amfissa, the river channel Mornou, the surrounding area of the city of Amfissa, the archaeological site of Delphi, the maritime city of Galaxidiou and Road Safety Park Municipality of Amfissa are areas of action programs of ESD Amfissa. The management of biodiversity (flora, ecosystems and landscapes), water, soil, energy and waste, climate change, the cultivation of olives, the basic principles for a sustainable built environment, geological changes in space and time, protection and enhancement of cultural heritage and creating conscious society in road safety education are the subjects of

work of environmental groups in Amfissa.

4. Conclusion

Four main problems were recognised during this research: lack of information on water management in the area, small revenues paid by companies for local resource use, overuse of water for agriculture and poor infrastructure.

Lack of information on water quality available for public is the biggest problem that was found during the research. Common view by the public is that potable water is not good for drinking because of various reasons from infrastructural problems to lack of information and commodity of bottled water. Use of rich regional resources does not provide enough revenue to the general public leading to a shortage of money for investments in local infrastructure. Examples are bauxite mining and supplying the capital with water. Both resources, water and bauxite is thus exploited by companies that do not return much of the profits into the local area of exploitation. Furthermore, local people are taught and told to be grateful to the companies for providing jobs from mining and for bringing water to the public via the canal. Third problem of overpumping of ground water leads to salt water appearing near surface and pollution by sodium, chlorine and potassium which makes soil not viable for agricultural use. Poor infrastructure related to water management (water and wastewater treatment plants, pipes, etc.), waste disposal and quality control leads to poor sustainability of the local community.

Some of the problems mentioned before could be tackled by increasing local participation and awareness of possibilities of the region for sustainable development. Dissemination of information on water quality and ways to resolve problems that are recognized by the general public should probably be the first step. Implementation of ESD programs for the local community as well as children is another possibility. Programs in place at the local ESD centre should be opened to the local public and adjusted to their needs. These programs could address problems as well as solutions and recommendations on an individual and municipal level. Informed locals could in future manage their problems by themselves, if possible, and impact authorities to develop and implement policies and strategies along with action plans to solve local problems.

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Water management in the area of Phocis prefecture and Parnassos National Park

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Summer School on Education for Sustainable Development in Protected Areas and Biosphere reserves in Amfissa, Phocis prefecture, Greece, from 6th to 19th of July 2014.

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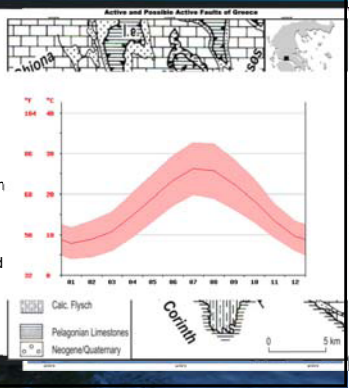
Results (1) / GEOGRAPHY, GEOLOGY, HYDROGEOLOGY AND CLİMATE

- Greece is the most earthquake-prone country in Europe
- The Itea - Amfissa valley divides the Mount Giona to the west from the Mount Parnassos to the east.
- Groundwater and the fractured carbonate rocks through which it moves constitute a dynamic system in which both the fluid and the container are actively reacting and changing in time and space
- Karst Hydrogeology at Amfissa and Around
- Why are karst aquifers important?
- Amfissa Climate



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Results (2) / PAST AND PRESENT WATER MANAGMENT

- WATER MANAGEMENT IN THE PAST
  - LEATHER PRODUCTION
  - WATER CISTERNS
  - OLIVE OIL TREES IRRIGATION
- WATER MANAGEMENT PRESENT
  - POTABLE WATER
    - EXAMPLE
  - SEWAGE WATER TREATMENT
  - TOURISM
  - BOKSIT MINES
  - LOCAL ESD

ΚΕΝΤΡΟ ΠΕΡΙΒΑΛΛΟΝΤΙΚΗΣ ΕΚΠΑΙΔΕΥΣΗΣ ΑΜΦΙΣΣΑΣ

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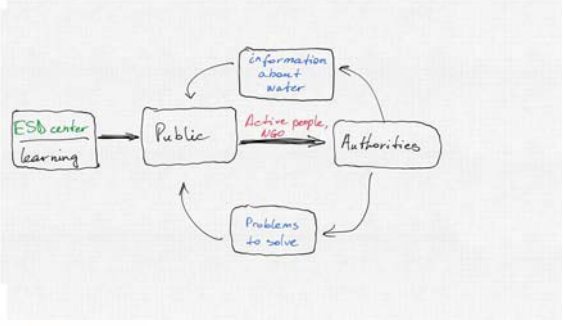
CONCLUSIONS AND RECOMMENDATIONS



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SD well know issues and scenarios

ESD Summer School in Amfissa, Greece was a multidisciplinary, multicultural practice that allowed us to critically compare and analyze our approaches towards sustainability and ESD. This lead to a broadening of knowledge and enrichment of our views on the issues underlining education for sustainable development.

The experience gained from the ESD Summer School in Amfissa, and the observations of the natural processes in the ecosystem of Mt Parnassus NP and the surrounding area, has helped us understand the importance and the dynamics of sustainable development as well as the interconnections between local communities, their social and economical needs and their environment.

During our field activities on Mt Parnassus we were made aware of the subject of responsible water management. Furthermore, the importance of specialized education focusing on water management was identified.

Effective water management cannot be achieved without the participation of well educated and critically thinking citizens. Thus we strongly suggest the introduction of specific water management modules into the formal educational curricula, from primary school to university.

Overall we consider this experience as a useful tool through raise the awareness of future participants. We recommend that this practice continues increases and expands this type of activity