Global Forum

For Environmental Education

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31st Caretakers of the Environment International Conference

Salem, Oregon U.S.A. July 1-8, 2017

Following Nature's Design

Caretakers of the Environment International

A global network for teachers, educators, and students

Global Forum – 31st CEI Conference Journal

Contents

CEI President's Message

Dear all delegates - students, teachers and colleagues – of the Caretakers of the Environment Conference 2017 in Salem, Oregon, USA

Welcome to this annual Caretakers of the Environment International Conference which is arranged of the Oregon Chapter of Caretaker's USA this year. Thanks to Dan Hoynacki, Ryan Kinnett and all helpers of the hard working Oregon conference team for having invited Caretakers of the Environment from all over the world to come to the green state Oregon in USA– a state that for many years has supported green and sustainable initiatives.

This year we have conference number 31 in a long row of successful conferences where students and teachers from many different countries and cultures have met to learn, to study, to network and to enjoy both formal and informal education all with the purpose to encourage environmental education and to encourage the younger generations to be aware of and to act on environmental challenges.

The theme of the 2017 conference is "Following Nature's Design" and the project groups have the possibility to focus on "Food Systems", "Natural Resource Management" or "Environmental Sustainable Design". The students and teachers are advised to choose an issue or a challenge from their own community and make research and academic studies to learn about the problem. It is suggested to develop partnerships to learn more and together develop solutions to the chosen challenge. During the conference all the projects will be presented to the participants and every year new ideas and solutions will be presented as inspiration and a great possibility to learn from other places and other cultures.

Every day we are presented of news that tell facts about our common globe – the Earth. These news can seem overwhelming and depressing. It seems that it is more and more important to learn about our common challenges, to improve understanding and critical thinking about both global, regional, national and local challenges. It is so very important that we learn that we depend on each other and the way we live and act. We must understand that we all are humans that live on the same globe. We have to feel solidarity and to respect differences and diversity.

Now is the time to listen and learn – to act – to be responsible - to be able to find solutions to be able to have sustainable living in the future. The conference is a forum where we all have the possibility to meet, to listen and to share. We get inspiration and knowledge from all over the world. We learn that it is possible to act and that a local solution sometimes can inspire to fight challenges many other places. We get new energy and new hope for our future on the Earth.

The future is not something distant - it is now – the next minute – the rest of our life.

Elisabeth Brun
President of CEI

Welcome Letter from 2017 Host

Dear Caretakers Family,

It is with great pleasure that we welcome you to Oregon for the 31st Annual Caretakers of the Environment International Conference. The theme, Following Nature's Design, is intended to provide participating delegations an opportunity to challenge themselves to connect with the simplicity of nature while recognizing the vast complexities of social and natural laws that apply to each of us in our communities. We are very excited to see your work around the sub-themes of food systems, natural resource management, and sustainable design. We are also very pleased to take you to many places within our home state of Oregon that demonstrate Oregon's commitment to sustainability and advocacy related to each of these sub-themes.

Caretakers of the Environment International has a very long history of individuals from around the globe working together to develop environmental awareness and knowledge, while helping our youngsters in every culture to develop as stewards and citizens. All participants, current, past, and future have been and will be provided a very special and unique opportunity to experience various cultures and work hand in hand despite cultural differences. What we see and expect is that we have far more in common than we'd ever imagine and that is what makes our Caretaker Family so vibrant, effective, and special. The common thread that we all share is that we care and through collective and collaborative efforts we can make positive changes in each of our communities making the world a better place for future generations.

We are all Caretakers. What we learn from each other at CEI 2017 through the experiences we share, dialogue with each other, and opening our minds to new ideas will remain with us for the rest of our lives. We will also be exposed to many valuable solutions that can be taken back to our individual nations and shared with others.

We challenge each of you to participate to the fullest degree at this conference so that you may get the most out of this experience. This will be the only time that this amazing group of individuals will be able to share a week together. Make the most of it. Push yourself out of your comfort zones to engage and connect with others.

Have a wonderful conference. We sincerely hope that your time in Oregon exceeds your expectations.

Most respectfully,

Dan Hoynacki ,
Ryan Kinnett,
Tony Currier Reagor
CEI 2017 Conference Coordinators

Left to Right: Ryan, Tony and Dan

Thanks to Sponsors and Supporters

Dear CEI 2017 Delegates,

Please join us in thanking our visionary sponsors and numerous supporters of the 31st annual Caretakers of the Environment International Conference.

Sponsors include Oregon State University Extension Service, Caretakers of the Environment International/USA Branch, Western Oregon University, Juan Young Trust, Mid-Willamette Watershed Alliance, Marion Polk Food Share Youth Farm, OPENEND and Roth's Family Foods.

Supporters include Cities of Monmouth and Independence, Oregon State University International Programs, OSU Colleges of Engineering, Agriculture and Forestry, Oak Creek Center for Urban Horticulture, North Willamette Research and Extension Center, Veolia North America, Friends of Timberline Lodge, Pearmine Farms, Agri-Plas, Inc., EZ Orchards, 350 Salem, Salem Environmental Education, SOLVE, OSU Extension Marion County 4-H and Junior Master Gardener Programs, Marion Soil and Water Conservation District, Pudding River Watershed Council, Cherry City Skeptics, and Chemeketa Community College.

We are honored and excited to have the broad diversity of participation and support for CEI 2017!

Dan Hoynacki
CEI/USA President & CEI2017 Co-Host

Ryan Kinnett
CEI/USA Treasurer & CEI 2017 Co-Host
Oregon State University

Caretakers of the Environment International / USA, Inc.

Youth Enviro Squad

Junior Master Gardener growing good kids

Agri-Plas, Inc.

open end

Salem Environmental Education

Pudding River Watershed

Oregon State University Extension Service

Western Oregon University

Juan Young Trust

Independence Oregon

City of Monmouth

Veolia

SOLV

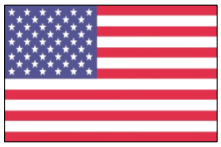
E.Z. Orchards

Chemeketa Community College

Friends of Timberline

Marion Polk Food Share Youth Farm

2017 Alumni Team

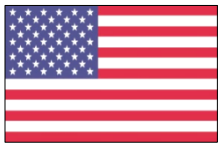


Emily Ausman

CEI USA-Oregon

Conferences: 2014 Taiwan

2015 Portugal

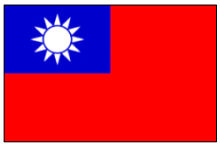


Nadia Young

CEI USA-Chicago

Conferences: 2013 Scotland

2014 Taiwan, 2015 Portugal



Yu-Wen Wu

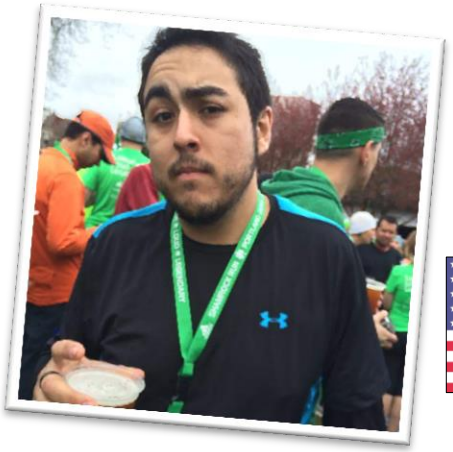
aka Selfie Kevin

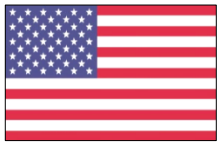
CEI Taiwan

Conferences: 2014 Taiwan

2015 Portugal, 2016 Denmark

CEI Youth Advocates





Zander Johnson

CEI USA

Conferences: 2007 Hong Kong, 2008 Denmark,

2009 Scotland, 2010 Indonesia

Jeff Antonio Yeo

CEI Indonesia/ USA-Oregon

Conferences: 2008 Denmark

2010 Indonesia, 2012 The Netherlands

Alumni Projects

Emily Ausman

Conservation of Design

For my project I worked to promote a more meaningful understanding of the history of National Parks and other land preserves in America. With this I wanted to frame Wilderness and Frontier as a human, rather than natural, design and challenge Western concepts of frontier as void of human interaction, especially in reference to Native American Peoples. To promote these ideas I presented a lesson to high school students participating in a outdoor education class and used this as an outlet for sharing my research with students who have an growing interest in the environment.

Nadia Young

Urban Sustainability and Agriculture

An issue that has been advocated for from environmentalists all over the nation is the struggle for sustainable food in urban settings. Fresh food in a city area is either overpriced or hard to travel to. Chicago is one of the first cities to begin to transform into a smart city and sustainable food is one of the first steps to the transformation. Many Chicago citizens want to take part of gardening so that they know exactly what they are eating. Gardens in a city environment are hard because of the tall buildings and not enough evenly distributed sunlight. Luckily, vertical garden innovations have begun circulating in order to provide citizens living in condos and apartments a gardening experience. Unfortunately, those not living in the buildings surrounding the Chicago Loop, do not have the same opportunities and only have the options of a local grocery store that either sells overpriced "organic" grown produce or imported produce that's grown unnaturally. Community gardens in these areas have started to gain popularity but no solution is found for the off-seasons. Farmers like, Tim Benedict, grown their own produce and try to sell it to local companies to provide naturally grown products. He also travels to local inner-city YMCA's to give knowledge about environmental sustainability to younger generations. If we continue to expand the number of YMCA's and educational programs that aim to educate younger audiences on sustainability, we can get the younger generations to make a change on how their food is produced. If we inspire them to eat locally grown produce and meats, as they grow older the number of imported products will decrease while helping local farmers to expand their network.

Kevin, Yu-Wen Wu

Quick and Fresh: Make Your Daily Meal!

I love cooking. So I combine my habit with my project. In this generation, more and more people work or study long hours every day. They are too busy to prepare a healthy meal, so they grab fast food with a lot of disposable containers for every meal every day. In my opinions, preparing a quick and healthy meal is actually very easy and it won't take much time. Then, I shared the idea with people in my university to prepare a healthy meal quickly every day. In order to execute the project, I invited a student club, American Culture Society in my university to promote and execute this project with me.

We shared my easy and healthy recipes with them who have interests in this project. Also, we organized an event to share how to make the dishes quick and healthy and reduce using tons of disposable containers and tableware. During the event, we promoted our main idea first and told them to share this idea on their social media and let more people know it. Also, we made fresh fruit pies and shared with everyone who attended. By following this project, they become healthier and reduce the quantity of disposable containers and tableware. Besides, I'm founding a fans page on social media to keep promoting my idea. I will share my healthy and quite recipes and diets on the page. I hope more and more people can join this project.

Review of CEI 2016 Aalborg, Denmark

30th CEI Conference, 27June-2July 2016

Coordinator

Sophie Bogø Rahbek Mortensen
- Aalborg Youth School, Denmark

Throughout the last 12 years I have attended eight CEI conferences and the ninth is coming up in just a few weeks in Oregon. First I attended as a student later as a teacher and last year (2016) in Denmark in a coordinating role.

It was quite an experience to be "on the other side" of the conference machinery. Months and months of hard work culminated in the first week of July in Aalborg, Denmark. It was so rewarding to see people from near and far gather again in the name of CEI and this year under the theme of 'Sustainable Societies'.

For me there were many highlights throughout the week. First of all walking around the different presentation rooms and watching and hearing the students proudly present their work was the ultimate highlight for me, as it always is. Also, the tours to the west coast of Denmark, was very rewarding. Throughout most of the week I was too busy with keeping the schedule and handling the unexpected to actually meet and talk to the conference participants as I normally do. However, my trip to the coast was a little break from that, where I got to talk to all the kind and interesting participants that had joined us in Aalborg. It was a complete joy to follow them and their reactions to the tour we had planned for them. Also, it was very rewarding for me to see my former students in action as 'Young Guides' on these tours and throughout the conference in general. They really thrived with the responsibility and I watched their hard work with pride.

Another highlight for me was the 'Hot Chair'- session at the closing ceremony. This year we decided that we would like to gather different stories and perspectives from many different CEI participants throughout the years. The idea was based on a reflection Elisabeth Brun (CEI 2016 Host) and I had about the history and the development of CEI. I have throughout my experiences with CEI heard many great stories about CEI, and this year we decided that we would like to share these stories with everyone. Andrew Cox, Anne Marie Begg, Fátima Matos Almeida, Joke Wals and Wayne Schimpff gathered on stage to talk about the development of CEI and share their own experiences with CEI. Later on Laura Cox and our CEI celebrity 'Selfie Kevin' joined the stage too.

I believe this knowledge sharing and respect across generations has always been unique for the CEI family, and I believe that a lot of the learning outcome from the conferences derives from the meeting of people from different generations and cultures. You can see the video from the hot chair session at cei2016.dk.

To sum up the CEI Conference 16' was another great and exciting experience for me, and once again it was lovely to be united with my CEI family in order to rethink and develop sustainable thinking.

Teachers

Gail and Wayne Schimpff

- Chicago, USA

25 CEI Conferences that Wayne attended and 20 that Gail has attended have created many memories. Our conference was again hosted in Aalborg. It created more new memories for the participants through the sharing of the caring about the environment in each of our parts of the world. For many participants, they struggled to learn the English terms, to express their findings and their conclusions about the part of their local environment they explored while doing their project. Out of the annual conference week of sharing with old friends and the making of new ones, the same bond of caring and sharing always becomes our common bond. It always amazes us is that how a local team comes together to make the conference happen. After always seeing so many smiling faces on all the local staff, I believe its the smile power that keep CEI growing and going. Thanks to all those that have smiled while hosting a conference and to those dreaming about the one they will host.

Student

Fredrika Viberg

- Allvar Gullstrandgymnasiet in Landskrona, Sweden

2016 years edition of the international environment conference Caretakers of the Environment International, CEI, took place in Aalborg, Denmark. It was a week filled with lectures, shared ideas and new contacts. A main part of the conference was about creating new friends over the boarders. Delegates from twenty-six countries all-over the world were gathered in the Danish city, sharing ideas and visions for a bright future and a more environmental-friendly world. Interesting ideas about everything from climate-effective building-materials for houses to energy-creating clothes were presented. It was very interesting to hear about different ideas and innovations from different parts of the world, and to get different perspectives and views on the important questions related to climate changes and environment. All delegates were showing a deep interest for sustainability and to be part of creating a good future. A strong fellowship between students as well as teachers brightened up the whole conference!

Photos taken by Karin Warlin

This kind of international conferences is a great opportunity to share ideas and opinions, but also an opportunity to get new friends and to create collaborations over boarders. Sweden was represented by a delegation of four members, and we really enjoyed taking part of the conference. Afterwards we all felt very inspired and touched by the fantastic involvement all of the participating countries were showing. It is clear that there is a strong will about taking part and facing the questions and challenges related to climate change.

30th Annual Caretakers of the Environment International Conference
Aalborg, Denmark 27 June – 2 July , 2016

Rights and Responsibilities Workshop Outcome Statements

During two 2.5 hour workshop sessions, more than 20 countries discussed recommendations to move forward the interactive role local 85 youth and educators from governments and its citizens should play in the building sustainable societies. The participants agreed upon the following statements to be presented to the Municipal Council of the City of Aalborg, as well as to be shared with their own individual local governments around the world.

Civic engagement

We encourage the government to encourage group activities, teamwork and problem-solving at the neighbourhood level in the community. By doing this we increase trust and friendship which is vital for the well-being in a community

Sustainable community

We encourage the government and parents to promote the idea of equality and green behaviour to young children (5-10 years), because we believe social equality and environmental awareness would result in greater well-being of all individuals.

Natural habitat

Natural habitats and their species should be provided with their basic needs for a healthier, stronger and more sustainable environment. We encourage you to educate people, and educate themselves, about habitats and species' needs concentrating on endangered species and preventing upcoming invasive species.

Sustainable society

We believe that treating disabled, refugees and minorities equally by offering special programs, activities, providing houses for refugees and educating young people how to be tolerant and respectful and sensitive towards cultural and economic differences.

Green education

We believe that students should learn some basic principles of sustainable development within their own families. Then, in school, they learn how to cooperate with others and lastly effect and influence the local community.

Facilitated by

Dan Hoynacki, Youth Development Faculty, Oregon State University, USA

Emilie Clara Jensen, Graduate Student in Environmental law, Aalborg University

2017 Student Projects

AUSTRIA

This year's Austrian project is carried out by 36 students of the *Bundesgymnasium und Bundesrealgymnasium Judenburg* attending the biology course BEE (Biological and Environmental Experiences in English). Out of this group 11 students will join the CEI-conference in Oregon.

In relation to the sustainable "*Styrian Strategy for Adaptation to Climate Change 2050"* released in September 2015, we continued the long term cooperation with the environmental department of the municipality of Judenburg also in this year to implement the strategy in three fields: education and global responsibility, household of water and water-management, conservation and biodiversity.

Bundesgymnasium und Bundesrealgymnasium Judenburg

Sustainable Measurements Supporting Ecosystems in the Alpine Region: Dealing with Neobiota

Teacher: Eva Gergely

Students: Bischof Anna, Alexandra Papst, Birgit Gall, Mathias Moitzi

Established ecosystems live on rich biodiversity of organisms providing these systems with stability and resilience. However, three percent of europian neobiota are invasive species, bringing harm to the area where they live in and reproduce.

In cause to that we wanted to find out: Why are these organisms so successful? What do they cause? Can we stop them becoming established here? Can we do something when they are already established? Therefore we supported the preparation of factsheets on local invasive plants for the citizens of Judenburg. The local inhabitants will soon get access to project results and information on the municipality's homepage and local pharmacies will hand out folders containing project information.

Hands on weeding of invasive species with local asylum seekers will help decrease these species and enhance stability of local ecosystems. In summer 2017 the project group will monitor the hand-weeded areas and data will be evaluated.

We then supported work on the second module of information boards about typical and rare alpine flora and its needs and again erected them in the alpine region in order to increase people´s consciousness.

Bundesgymnasium und Bundesrealgymnasium Judenburg

Sustainable Measurements Supporting Ecosystems in the Alpine Region: Mountain Waters and Human Influence

Teacher: Eva Gergely

Students: Melanie Leitold, Sandra Stroissnig, Julian Rieger

In 2017 we continued the analysis of two small lakes in the alpine area without human influence and two other lakes with swimming area and regeneration area for wildlife. Then we again compared the results of the investigation about these aquatic ecosystems to find out about this year's changes due to a long cold period of minus 20 degrees centigrade for all four and human influence on two lakes. This project module comprised excursions and activities in a dinghy, taking samples and laboratory work using reversing microscope.

And we wanted to find out for the rivers and lakes: How do different ways of using mountain water influence physically and chemical factors? Which saprobies, plankton and bacteria do we find?

Therefore, we accomplished ecological projects, some of them together with primary students of the 3rd form at our school pond and the Oberweg creek. We continued with chemical, physical and biological studies of the river Pöls and the four lakes. The results are presented to the public as part of a special art project called "Humility" with the aim to increase appreciation for an intact nature.

Bundesgymnasium und Bundesrealgymnasium Judenburg

Sustainable Measurements Supporting Ecosystems in the Alpine Region: Sustainable Wood Management

Teacher: Eva Gergely

Students: Julia Papst, Clara Sorger, Sarah Seifter, Jasmin Pichler

We started an ecological geocaching project on sustainable Styrian wood management in cooperation with a local paper mill, the Technical University of Graz and Pro Wood Styria. We wanted to answer the following questions: Which adaptions to climate change do we find in forestry plant growth? Which type of wood is used for paper production? How does pulp and paper production use product cycles? What is the paper mill's impact on the environment?

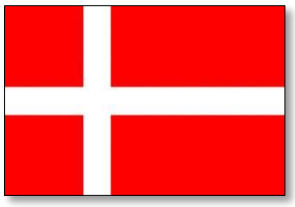
The visit of LIECO, a company that grows different species of trees adapted to European altitudinal belts showed, that climate change is a factor we have to deal with today. Water analysis activities were carried out at the river Pöls, that is providing the paper mill with water and work in the laboratory of the Technical University of Graz was done.

In autumn we will present our results in a geocache around the valley the paper mill is located.

An interview with Dr. Vogel, CEO ZPA Pöls, showed that the company also does research in cooperation with the technical University of Graz to enhance the use of substances being produced in pulp and paper production like the organic polymer lignin and the by-product tall oil.

The interview with the mayor of Pöls showed that there are sustainable efforts to deal with climate change.

DENMARK



UngAalborg / Aalborg Ungdomsskole

Following Natures Design, Is It Possible?

Teachers: Sophie Bogø & Asbjørn Heby

Students: Anne, Camilla, Malthe, Jonas

Partner Organization: Aalborg Municipality

Topic

The main purpose of our project is to discover whether the 2017-teen in Denmark can follow natures design. To answer that we are going on a two-day fieldtrip in the wilderness where we will follow natures design to learn which points we are able to follow natures design and on which we are not.

Different outcomes

Fundamentally we see three different outcomes of our project.

1. We find that it's not possible to follow natures design, thus we should not look towards nature to find environmental solutions.

2. We find that in a clear majority of the variables it is possible to adapt nature's design to reduce our everyday carbon footprint.

3. We find it is a combination of both opportunities. On some points, it is possible to follow natures design to a lager extend, whilst there are other points where it is not possible to follow nature's design.

We see the last opportunity as the likeliest.

Research

Our research serves two main purposes.

1. To know the Danish legislation about protection of the natural environment.

2. Marlow's hierarchy of needs.

The research will be used in our analysis and is furthermore the basis of our variables in the experiment.

What to do (Method)

To carry out this project we have chosen to use different methods. By the use of qualitative data and fieldwork it is possible to answer our research question. The research question will be examined based on the deductive method where the theory behind Maslow's hierarchy of needs is the foundations of the experiment's variables.

Take action

One of the main purposes with our project is to make a basis to a field trip where the variables can be tested again. This means other students will be able to go on the same trip and test the same variables which will ultimately lead to two things:

1. Other students have the possibility to experience what it is like to follow nature's design.

2. The experiment will be tested again and new and data will be collected.

UngAalborg / Aalborg Ungdomsskole

Sustainable City Planning

Teachers: Sophie Bogø & Asbjørn Heby

Students: Frederikke, Cecilie, Emma, Diana, Katrine

Partner Organization: Aalborg Municipality

Our topic is sustainable city planning and we're going to focus on Aalborg since that is where we come from. The topic fits under the theme "Following Nature's Design" because we are going to research how to change the design of Aalborg to make it more sustainable and ready for the rising of water and the bigger amount of rain.

Problem Statement

Through the last 10 years there has been an increase in the volume of water in Denmark. This has led to more

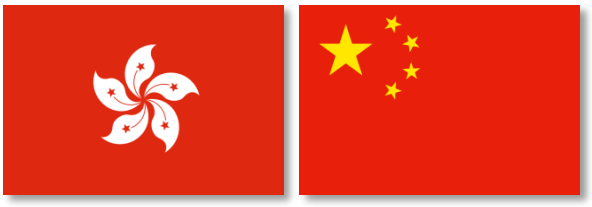
flooding near residential areas, which leads to the destruction of houses. It's the municipalities' responsibility to make sure that the sewage system can handle the water. This means that bigger cities need to develop new systems that can handle massive volumes of water.

We have researched whether cities like Aalborg are ready for this increase in water and what they can do to prepare and help prevent the flooding.

Through our project, we will study the sewage system in Aalborg and find out what improvements that need to be done, to optimize the system so it can handle more water. Furthermore, we will talk about the water rising and why it's becoming a problem. We will explain what Aalborg does to make sure the city doesn't get flooded.

In Denmark, some places the asphalt is constructed in a certain way, so that water can pass directly through and into the ground. We will show how this works compared to normal asphalt.

HONG KONG, CHINA



Po Leung Kuk Laws Foundation College

Threats and Conservation of Horseshoe Crabs in Hong Kong

Teachers: Leung Wing Kin, Lui Ka Sing

Students: Doris Cai, Chun Lam, Vincent Yik, Jeanie Yung

Partner Organizations: Ocean Park Conservation Foundation Hong Kong, Department of Biology and Chemistry of the City University of Hong Kong

Among the four species of horseshoe crab species found globally, there are two found in Hong Kong. However, researches (Li; Shin; Shin, Cheung & Laurie) point out that extensive reclamation and coastal development destroy the spawning habitats of horseshoe crabs, resulting in a dramatic reduction in their population in the territory.

In our recent project, since November 2016, in collaboration with the Ocean Park Conservation Foundation Hong Kong and the Department of Biology and Chemistry of the City University of Hong Kong, attempts have been made to raise 15 juvenile specimen of *Tachypleus tridentatus* in the laboratory of our school. The plan is to release these juvenile horseshoe crabs in a selected mudflat habitat in Hong Kong in June 2017 when they

become stronger and less vulnerable to danger in the wild. It is hoped that this project can assist in raising the survival rate of this endangered species in Hong Kong.

The 15 horseshoe crabs were raised in carefully controlled environment with optimal salinity, temperature and dissolved oxygen. Their growth was monitored by meaning their weight and carapace width weekly. At the same time, a booth was set up to educate schoolmates about the importance of conserving this marine species.

Po Leung Kuk Laws Foundation College

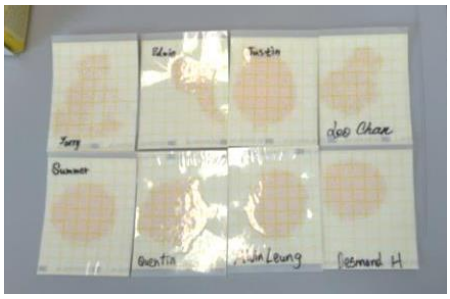
Threats and Conservation of Fireflies in Hong Kong

Teachers: Leung Wing Kin, Lui Ka Sing

Students: Leo Chan, Quentin Chan, Desmond Hui, Edwin Ho

Partner Organization: Hong Kong Firefly Conservation Foundation

Fireflies are facing a few threats in Hong Kong: diminishing habitats and light pollution are the most common. Many firefly habitats in Hong Kong, mainly in woodland and freshwater areas, have been developed into urban areas. Light pollution also weakens the light of fireflies, which means interruption of their communication with their own kind.



In our recent project, there has been an attempt to identify the main threats fireflies face in Hong Kong. In the past few months, we have been working closely with the Hong Kong Firefly Conservation Foundation (http://hongkongfirefly.weebly.com). We participated in a workshop, fieldtrip, and a two-day camp organized by this organization. Also, under the guidance of this organization, a piece of woodland near our campus has been identified as a potential site for fireflies rehabilitation.

In that piece of woodland, a few fireflies have been observed. Subsequent field surveys on firefly larvaes and quality of river water have been carried out. It was found that the quality of the river water in the woodland is satisfactory. In the future, we will continue our work on this piece of woodland, turning it into a suitable habitat for fireflies. Collaborating with the Hong Kong Firefly Conservation Foundation, breeding of fireflies in the school laboratory will be attempted. It is hoped that the population of wild fireflies will be raised through this effort.

Polluting the environment means not only a worse living environment but also threatening various species in nature. Through this project, it is hoped that the awareness of our schoolmates towards the environment could be raised. A booth was set up to spread the message of environmental conservation for fireflies. It is planned that when fireflies are being bred in school in the future, live demonstrations can be carried out for first-hand exposure of our schoolmates to this species.

SKH Tang Shiu Kin Secondary School

Promoting Upcycling in the Community

Teacher: CHAU Yuk Lin

Students: CHAU Tsz Wai, Annabel; KONG Cheuk Ying, Amy

Partner organization: Methodist Wan Chai Elderly Centre

Recently, upcycling has been emerged for waste management in Hong Kong. To make it successful, our roles, as citizens, should be to put the waste into recycling bins and to purchase the products made from the recyclable materials. However, it is not very popular here.

A research has been conducted to find out why the

citizens did not participate in upcycling actively. It has been found that they are lack of awareness about reducing waste through upcycling. They even have not heard about the term 'upcycling' before and are not sure what they can involve in the upcycling industry. To be honest, upcycling is a process which requires creativity and takes much time to work it out. It is hard for Hong Kong people to carry it out often. Together with government's lack of emphasis on upcycling in the environmental policies, upcycling is still not a common practice in the Hong Kong society. Therefore, it is necessary to increase the public awareness about the need of upcycling.

To spread the concept of upcycling, activities such as visits and workshops, were organized, attracting over 200 students and old people. About 80 elderly people from the Methodist Wan Chai Elderly

Centre, accompanied by 40 students, were arranged to visit the Jockey Club Museum of Climate Change where upcycled products were demonstrated. On another day, 38 students looked at the fascinating furniture made from recyclable materials in T-Park. Also, a group of 23 students went to a shop called Lamma Corner where the shopkeeper gave a briefing on upcycling and a variety of these products were sold in an outlying island. Last but not least, a group of 26 students were arranged to join a workshop of making vases from cullet in the Community Green Station in Shatin.

SKH Tang Shiu Kin Secondary School

Problem of Water Quality in the Shing Mun River: Who Should Be Responsible?

Teacher: CHAU Yuk Lin

Students: LEE Tsz Hin, Edward;CHENG Yan Lok; HO Choi Wa; LAW Man Him, Nathan

Partner Organization: Open University of Hong Kong

After 30 years of government's effort, it seems that improvement has been made in the water quality of the Shing Mun River in Hong Kong. However, it is still being threatened by some human activities. Therefore, our project aims at investigating the water quality of the Shing Mun River in different river courses and evaluating who should be responsible for the problem.

To study the water quality in the Shing Mun River, a group of 29 schoolmates joined 'Adopt a Water Buddy' programme organized by the Open University of Hong

Kong and supported financially by the Hong Kong and Shanghai Banking Corporation (HSBC). To test water quality, 3-5 water samples were collected in the lower course, middle course and upper course of the Shing Mun River on 18 Feb, 25 Feb and 8 April 2017 respectively. Water Sampler and Horiba® U53 Multiparameter Water Quality Checker were used to measure the parameters indicating water quality, including water temperature, pH, conductivity, turbidity, dissolved oxygen and salinity each time. The average for each parameter was calculated in each data collection.

Our findings have shown that different groups of people should be responsible for the problem of water pollution in the Shing Mun River. First, the government brings the negative impact on river quality through the use of hard engineering strategies, including construction of reservoir and channelization. Next, the owners of garages and restaurants and factory owners are also the major contributors to water pollution. Finally, the local residents and visitors play less important role in affecting the water quality, but the impact of littering also brings visual pollution.

To increase the public awareness of water pollution, a video of different people's role in water quality problem will be made.

SKH Tang Shiu Kin Secondary School

Can the Shing Mun River Provide Good Living Environment for Us?

Teacher: CHAU Yuk Lin

Students: CHEUNG Tsz Chun; HO Wing Him; CHUNG Cheuk Nam; LEUNG Tze Chung

Partner Organization: Open University of Hong Kong

Some researchers have highlighted that the public desire to make the Shing Mun River become a place for leisure and recreation and tourist spot, which in turn gives them a better living environment. To meet their need, it is important to keep the river and its river banks clean.

Water quality monitoring is one of the ways to detect the early threats and give the direction of improvements of water quality. Therefore, we joined 'Adopt a Water Buddy Programme' organized by the Open University of Hong Kong and Wofoo Social Enterprises to learn how to monitor the water quality with the help of water sampler and Horiba® U53 Multiparameter Water Quality Checker.

In the programme, relevant data, including the parameters indicating the water quality were collected at the upstream, midstream and downstream of the Shing Mun River on 18 Feb, 25 Feb and 8 April 2017 respectively. Additional data about the feelings of local residents and visitors about it were collected through online questionnaire survey.

The findings showed that the water quality in the upper course was not good. Most people perceived the

water quality to be quite bad or bad. They are not satisfied with the sewage problem, turbidity and unpleasant odour smell. These even bring adverse effects on their living environment, outdoor activities and health. As a result, Shing Mun River still cannot provide good living environment to us, especially the residents living nearby.

In order to increase people's awareness of the importance of the conservation of river quality for better living environment, we will upload our report to the website. Also, we will design a poster to promote the ways of reducing water footprint so as to minimize the illegal discharge of effluents.

Queen Elizabeth School Old Students' Association Secondary School

Possibility of Developing Organic Farming in Hong Kong

Teacher: LAU, Sau Han Lilian ; WONG, Hing Yi Annie

Students: WONG, Wai Kin; WONG, Kwun Han; LEUNG, Ka Wai; TAM, Yat Hin

Partner Organization:

Dr. CHEN, Wan Ning, the organizer of Homeland Green-HONG KONG

Mr. CHENG, Kai Kui, a Hong Kong local organic farmer

Ms. CHAN, Kai Yee, a geography teacher in secondary school

Consuming organic products are becoming a trend in Hong Kong (HK). Each year, HK imports many organic agricultural foods of high quality from different countries, like the USA. However, only 1.84% of local HK farmlands were used for organic farming in 2016. Moreover, the total supply of organic crops by local farmlands was fewer than 0.3%. It is obvious that the development of organic farming in Hong Kong is relatively slower than that of other regions.

This project aims to

1. Investigate the problems that hinder the development of organic farming in HK;
2. Propose some recommendations to the HK Government and the organic farmers.

After the interviews with some local organic farmers, the

study of relevant reports and visits of various local organic farming markets, we have discovered some difficulties. We also compared the corresponding policies with some neighboring cities such as Tokyo and Singapore, which have higher vegetable self-sufficiency. In order to solve the above difficulties, we advise some suggestion to the HK government.

The demand for organic crops are large. HK needs to import organic crops from other regions to satisfy the huge demand, like U.S.A. and the Mainland China. Therefore, we know that HK organic farming can be further developed. We suggest HK organic farmers plant the five most popular organic crops, which are choy sum, cherry tomatoes, corns, broccolis and potatoes. If we can plant our own organic crops to meet our own needs, the food miles can even be reduced.

In economy, environment and culture terms, developing organic farming can bring more profits to farmers, enhance sustainable development and retain village culture respectively. Therefore, HK should develop organic farming.

Queen Elizabeth School Old Students' Association Secondary School

Tackling Food Waste Problem

Teachers: LAU, Sau Han Lilian; WONG, Hing Yi Annie

Students: CHUN, Yee Mei; LAW, Tseng Yan;

LEE, Chun Yui; SZE, Wai Nok

Partner Organizations:

Dr. CHEN, Wan Ning, the organizer of Homeland Green-HONG KONG

Mr. CHENG, Kai Kui, a Hong Kong local organic farmer

Ms. CHAN, Kai Yee, a geography teacher in secondary school

Hong Kong (HK) is a highly-populated city. 10,164 tons of municipal solid wastes were produced daily in 2015. The majority ends up in the three landfills in HK. However, these landfills will be fully filled soon and give rise to the urgent needs to reduce the amount of the solid wastes. As 33% of the municipal solid wastes were food waste, therefore, it is believed that proper treatment of the food waste is the most crucial way to relieve the overflowing of solid wastes in HK.

To deal with the problem, in 2011, the HK Government set a target to reduce the amount of municipal solid waste per capita by 40% until 2022. The HK Government has adopted four strategies for food waste reduction. They are the 'Food Wise', food donation, food scrap collection and 'Waste-To-Energy'(WTE) projects.

Our project aims to investigate the present situation and to give suggestions to improve the problem. We collected our datum through conducting interviews. In our research, we have explored different ways of collecting local food waste, the difficulties of the related parties encountered, and the effectiveness of current policy on enhancing public participation.

The WTE project is believed that it would be more effective than the others strategies. We suggest that the government should increase the number of organic wastes treatment facilities. The projects will not run efficiently without the assistance of HK citizens. In order to raise the HK community involvement in food wastes reduction, three ways were suggested by us. Firstly, HK citizens should sign and follow Food Waste Reduction Charter. Secondly, HK citizens should produce less food waste. Finally, HK citizens should change the food waste into some useful materials.

INDONESIA

Sekolah Bogor Raya

Hydroponics: Modern Agricultural Method for Urban Society

Teacher: Mario Donald Bani

Students:

Andre Gunario, Atthur Raihan Mudathsir, Cintya Wardani, Evan Patrick Nicolas, Hugo Timotius Limantara, Marhas Maharani Djannah, Revandy Syam Rasyad, Virginia Linelly Sanchez Taslim, William Tandridinata

Partner organization: **SBR Hydroponic**

Hydroponic is a modern agriculture method which is suitable for urban society where land for farming activities is not abundantly available. It is a subset of hydroculture in which the agricultural crops are grown in mineral nutrient solutions without any soil. The roots for these plants are exposed to mineral solutions and be supported by an inert medium, such as rock-wool or hydroton. Nutrients for hydroponic plants can be from fish waste (this method is developed as aquaculture) or chemical fertilizers.

Sekolah Bogor Raya is interested in developing this modern agriculture method for students due to the fact that most of our students live in a city area and they don't usually have access to land or garden that can be used to grow plants. By learning to grow plants using hydroponics, our students are able to occupy the building in a city center with farming block which usually has access to plenty of water and sunlight. These are the two main factors required for the growth of the hydroponics plants.

So far, we have managed to harvest different lettuce plants which we could sell to the parents and the local communities. We have started to grow tomatoes and pumpkins plus some other fruits which can occupy the top floor of our school building. In order to reduce the waste material from our hydroponic project, the hydroponic products which have not been sold, were used as the main ingredients in producing compost which we used to fertilize different plants around our school.

Medan Raya Nature School

The Concept of Equity and Population Adjustment

Teacher: Andhika Bayu Pratyaksa

Student: Azzam Habibullah

Partner Organization: Indonesia Nature School Network

The explosion of human population seems like a nightmare of the extinction of human themselves.. This condition is worrying, poverty is getting widespread, the decrease of education quality, the number of unemployment sharply increased in every country.

According to the research, the human's weight less that 0.5% of the whole animals' biomass. Another surprising one, if the whole ants gathered and weighted, its weight would be at least twenty times more than the whole human. In fact, at a glance, the ants are always seen in small number.

There is only one conclusion; *The Earth could still accommodate human. But the human's life is not equal with the region or space one another. It causes population density in narrow space.*

The concept of **"Equity and Population Adjustment"** is the solution that I recommend to solve the world population explosion problem. In shorts, the meaning of this concept is; '*Removing some populations from the narrow country with the big population into the wide country with small populations'.*

With this program, the relationship between community and government will improve. They can work in a new place, start a new life, get enough water, food, and energy, with government protection.
For this reason every state government should campaign this concept to its people. Deliver two things:

First: This is purely a social movement, not a political movement that harms one and benefits the other.

Second: Giving an open understanding to all of his people, that "This is our earth. Where we live together. And that's all we have ".
This is not only can save nature and its creatures, but also realizes the dream of peace on this earth.

Sekolah Alam Indonesia (Indonesia Nature School)

Electricities from Plants

Teachers: Adhika Bayu Pratyaska / Ainun Nurul Fitriyah

Students: Thoriq Yahya Abdullah

The research is about electricities from plants, so while photosynthesis happen in plants (it is producing oxygens and reducing carbon dioxides), it can generating electricities. The purposes of the research are to find alternative energy solution available on earth to provide electricity for human half-home-scale needs, to use plants planted in many places in the world as an alternative energy resource, to provide electricities.

Our society today requires a lot of equipment that uses electricity such as television, telecommunications devices, lights, etc. But as much as 35% of Indonesia's population has not enjoyed electricity, especially in

remote and rural regions. All this time, people use energy from fossil resources. This kind of energy resources cannot be recycled after they are expired. People today are in a need of alternative electrical energy that will be environmentally friendly. We combined urban need of green spaces and this plants electricity, so we created Urban-Plant.

We did this research under scientific procedures of Institut Pertanian Bogor (Bogor Agricultural Institute, http://ipb.ac.id/)]. The result of this research shows that plant/s can really produce electricities even on a small scale, and the highest voltage measured was 0.5 voltages per second.

Our conclusion in the study of 'electricity power from plants (tomatoes)' can be concluded that the plant can produce electricity with a voltages range of 0.13 volts - 0.32 volts that can be affected by weather conditions such as rain at the time of observation, hot, windy and soil conditions such as pH, DHL, and salinity. In observation during the study proved that the highest increase in the power supply voltage measured at night is when the process of oxidation (release of electrons into the ground).

Project media: (Instagram) @theurbanplantproject

Pempek is a specialty and cultural identity of Palembang. Pempek is to Palembang, as spaghetti is to Italy or sushi is to Japan.

Pempek dough is also used to make 10+ different dish. Residents of Palembang (about 2 million people) eat pempek every day, in almost every meal. Pempek is made of fish and sago by 1:1 ratio. Pempek made from snakehead murrel (*Channa striata*) is considered more 'genuine' than pempek made from saltwater fishes. Traditionally, the best pempek are those made from belida (*Chitala lopis*), but due to overfishery, this kind of fish is now extremely scarce.

Demand of snakehead murrel in Palembang has been increasing over years. Production of snakehead in Sumatra (where Palembang is located) decreased substantially over last 5 years. Most of snakehead murrel sold in Palembang's market is bought from the island of Kaliamantan. Aquaculture of snakehead murrel is uncommon in Palembang. Pempek business people prefer to use caught snakehead rather than the raised one. It is said that raised snakehead, despite its big size, is lack of taste and good texture to make pempek. A pempek made of raised snakehead has softer texture, that quality is considered bad for pempek.

Jaringan Sekolah Alam Nusantara (JSAN)

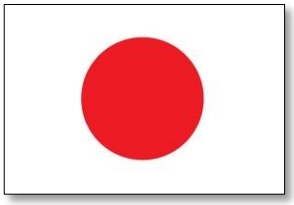
Sustainable Fishery for Pempek Production

Teacher: Ainun Nurul Fitriyah

Students: Muhammad Jawad Yuwono, Imadul Aqil Yuwono, Thoriq Rifki Mubarok

Indonesian cuisine is one of the most vibrant and colorful cuisines in the world, full of intense flavor. With about 300 ethnics calling Indonesian their home, the cuisines differ greatly between regions. Our hometown **Palembang**, South Sumatra Province, is renowned for its fishcake-like food called **pempek**.

JAPAN



Daimon Prefectural Senior High School

Advancing to a Sustainable Toyama: From Personal Transportation to Mass Transit

Teachers: Kawauchi Hiroyuki, Takase Akiyo

Students: Otsuji Yutaro, Yamazaki Atsuto, Yakura Kaya, Aoyanagi Yurina

Partner Organization: Manyosen (Manyo Line) Incorporation

The most familiar transportation for us, senior high school students in Japan, is the bicycle. If the destination is relatively near, many people use bicycles. They use public transportations such as trains and buses if they want to go somewhere far. Yet, we see many cars when walking or riding a bicycle. The possession rate of cars in Toyama Prefecture, where we live, is especially high in Japan. So we are afraid that this situation can cause safety and health problems. How can we reduce the amount of traffic in our cities for our good safety and health?

In order to achieve our goal, necessary is the prevalence of positive attitudes to use public transportations like trains and buses. Unfortunately, however, it is the case in Japan, especially in rural areas, that most people (adults) prefer private cars because of their relative convenience. As a result, there are many endangered companies that run trains or buses. One of the reasons why people do not want to use public transportations is that train or bus companies tend to be unable to respond swiftly to requests or needs of the users due to a lot of, and a variety of, constraints they have in relation to their stakeholders and their budget. And this accelerates the trend to depend on auto mobiles. Then again the companies are challenged to meet demands from the users. They have been in a vicious circle. The only way to break the status quo is to actually use public transportations so that we can help them survive. It is not for them but for our sustainable healthy safety life.

POLAND

Szramek High School in Katowice

Ways to Help Our Oceans

Teacher: Bożena Kurzeja

Students: Oliwia Gubała, Magdalena Stępniak, Maciej Biegas, Aleksander Feruś, Tomasz Janiec, Maciej Kamrowski, Wiktor Sawicz

Partner organization: Górnośląskie Przedsiębiorstwo Wodociągów Spółka Akcyjna

We have taken on a lot of challenges to minimize our ecological footprint.

1. We decided to find out to what extent students in our school were aware of the impact of CO_2 on seas and oceans. To this end, we conducted a survey among our mates. We also invited a school from Italy to cooperate in the project. As a result of our cooperation, we made presentations on human impact on seas and oceans.

2. We decided to create our own ocean ecosystem in the form of a fish tank and a shrimp tank. We collected funds to buy all the necessary tank accessories through a wastepaper collection.

3. We organised an ecological workshop for our second-year middle-school students entitled “Ocean Carbon Cycle”.

4. During the school open day, our team invited everyone to a workshop entitled “Entomological Delicacies” during which they could taste some specialities made with insects.

5. Attending weekly workshops run by our biology teacher, we decided to design a website on which we publicise what we have learnt, and we also post information about the project.

6. We organized a competition for the most beautiful classroom-conservatory. We also organised a lavender day. We wanted to popularise lavender as it is known for its CO_2 absorption properties.

7. We played host to Prof. Wojciech Macyk, Prof. Ryszard Laskowski at Jagiellonian University in Kraków, and a number of Silesian secondary-school students. In the meeting we gave a presentation on the influence of acidified ocean water on marine organisms.

8. On 20 April, we went to the Kobiór Forest Area where we took part in a workshop on forests as CO_2 sinks. We found out about a forest nursery. We are proud of the forest we planted that day.

9. As part of this year’s Earth Day on 22 April, we organised an ecological picnic and a competition on environmental problems for the students in our town. We also cleaned the area of the “Morawa” water body.

PORTUGAL

José Gomes Ferreira High School

Planting Our Own Food

Teacher: Maria Emília Fernandes Luís Martins

Students:

Maria Ramos Bárbara de Vasconcelos Pires

Maria Teresa Viegas Aleixo de Matos

Sofia Malta da Silva de Mendonça

Inês Corvo Marques da Fonseca

We are a group of students from High School José Gomes Ferreira - Lisbon, Portugal.

At our school, some biology students are in charge of taking care of the garden. There, we plant countless varieties of herbs, vegetables as well as fruits. Within this task, “Planting our own food”, we tried to find a sustainable answer to the following question: how can we improve our school’s garden’s soil?

For this reason, we conducted an experimental procedure initiated with testing the soil in order to find which specific nutrients were lacking. However, we discovered that this was not the only problem: the absence of organic matter and soil’s nature (clayey soils are not the best for growing food) also emerged as setbacks.

To link our work with this year’s CEI theme - Following Nature's Design, onwards our knowledge, we attempted to reproduce a few “techniques” that Mother Nature offers in order to achieve our goal within a sustainable farm work.

We started by trying to find the best form to correct the soil. We chose a spectrum of fertilizers - manure; vermicompost; chemical fertilizer, among others. We mixed each fertilizer in the adequate proportions with soil and afterwards, planted in vases, mustard plants with the correspondent fertilizer (more than one plant for each fertilizer). We then observed and measured their growth.

Finally, we compared the obtained results (the plants’ growth and number of leaves) for each fertilizer and concluded on which was the best suited fertilizer for our goal.

RUSSIA

LInTech (Lyceum) №28, Kirov

Microgreens- A Kitchen Garden on the Windowsill

Teacher: Marina Konopleva

Students: Zorin Dmitrii, Klabukova Iana, Kozlovskikh Alina, Kropachev Ilia

Partner Organization: roszelen.rf

Our goal

To learn how to grow and use microgreens as additional source of vitamins

Tasks

1. To get information and learn literature on this theme.
2. To meet with the organizer of the microgreen farm in our town.
3. To find plants in the shops of our town which we can use as microgreens.
4. To find out on which types of soil it is better to grow microgreens at home.
5. To find out which types of microgreens grow better in our conditions.
6. To share the information at school and in the community.

Working on project

Microgreens have up to 40 times more vital nutrients than mature plants. The flavor of microgreens is also more intense. Due to their high water content, cooking microgreens isn't recommended. You don't need much to add flavor and spark to the plate.

We know now that microgreens are quick and easy to grow indoors on a sunny windowsill. We tried to grow different kinds of microgreens on different types of soil. The best harvest was grown in the box with usual soil for houseplants. It was sunflower.

We told the teachers and the pupils about good qualities of microgreens and offered to try at the lessons and during all-school event "Cut and Eat" which was held at the school canteen.

Conclusion

We have learnt that the people of our town do not know much about microgreens, their usefulness for our health and how they are grown. We believe that it is necessary to share this information with people. It will help them to have vitamins at the end of winter and in spring and it can improve the immune system.

LInTech (Lyceum) №28, Kirov

Vitamins on the Kitchen Bed

Tteacher: Tatiana Khodyreva

Students: Artem Moshkin, Victor Gotovtsev, Ilona Orlova, Liza Gavrilova

Relevance of the project

We live in the north-east of the European part of Russia. People say about the weather in our area “We have 9 months of winter and the rest is summer.” Of course, this is a joke, but in real, winter begins in late October- early November and ends at the end of March, sometimes, like this year in April there is still winter. In the regard, people experience a great lack of sun and vitamins. We decided to study how people help their body fill the lack of natural vitamins in this long period.

Objectives of the project

1. To study the situation with supplying inhabitants of our town with fresh greens, vegetables and fruit in winter and spring period through the shops.
2. To get acquainted with the alternative source of vitamins- micro greens
3. To analyze what percent of the population solves this problem through cultivating seedlings, greens, vegetables in their gardens (dachas).

4. To participate in the planting flowers near our school and growing seedlings for gardens.

We collected information about increasing of consumption of vegetables, greens and fruit in the winter period: we visited town markets and stores. We met with the producers of Vito boxes for cultivation of micro greens, made an experiment with growing beets for salads. Our group organized a survey of ninth grade students if they had gardens and what they grew there. We took an active part in preparing flower vases for school. We are experiencing in our gardens with growing vegetables.

Sec School No 37, Kirov, Russia

We Eat to Live, Not Live to Eat *(Socrates)*

Teacher: Marina Avdeeva

Students: Papulina Sofia, Filippova Anastasia, Kosulina Eseniia, Plaksin Saveliy, Zykin Mikhail

Hypothesis of our project work is – there is a connection between the nutrition and health. If we know more about useful nutrition, follow the guide to healthy eating, we will avoid risk having gastrointestinal illnesses.

Nowadays teens' health remains one of the urgent problems in the place where we live and it deserves a very close attention both from medicine and education authorities and from families. It's absolutely evident that the health and quality of life of the whole nation in 10-15 years depends on the health of teenagers at present time.

Statistics show, that 70% of 10-17-year-olds in our region suffer various diseases. The number of children with excess or insufficient weight has increased in recent years. The number of sick children becomes twice as large at the age of 10-12 when the amount of home tasks grows. By the age of 15 teens suffer gastrointestinal diseases and have poor eyesight. Usually teens have good appetite and it's wonderful. But at the same time it's necessary that they eat healthy food instead of junk food, which is daily advertised in mass media and is easily prepared in the families.

There should be a way out to change the situation for the best!

We collaborated with the Vyatka State University and made some experiments in their lab to find out why the milky products, made in our hometown, are usually prescribed during or after antibiotic treatment.

Besides, we found out that fruits and vegetables sold in the shops very often contain harmful substances for our health. This is one of the reasons, why local people grow apples, tomatoes, cucumbers, carrots and different berries in their gardens. We decided to actively participate in this process and learn how to grow vegetables using organic farming.

So, next time you go to the store you might want to think about what you are really eating, we think the best way to ensure that your body is getting the right nutrients is to grow your own products. With just a little time and effort you can have a wonderful organically grown garden.

SWEDEN

Öresundsgymnasiet, Landskrona previos name Allvar Gullstrandgymnasiet

Detection of Plastics in Soil – Can Earthworms Be Used?

Teacher: Karin Warlin

Student: Thi Khanh Ly Nguyen

Sponsored by Dow Chemicals

Small plastic particles in the oceans are a phenomenon recently discovered by the scientific community. Micro plastics are small pieces of plastics in the size range 0.3-5.0 millimeters. They come from various sources, ranging from broken plastics in the ocean to cosmetics and granules from synthetic turf plan.

Nowadays sewage sludge is being used as fertilizer as it is nutritive. But the fact that it contains plastic particles has not been mentioned that much. What kind of consequences this could lead to for organisms in the soil, for example the earthworm is unknown. For this reason, the earthworm was used as an indicator. The aim was t o investigate whether worms contain plastic particles after being exposed to it in the soil they live in. The earthworms were fed with sludge from Lundåkraplant in Landskrona for three weeks in a self-

constructed compost box. This was compared to a control group without sewage sludge.

The worms were dissected and parts like the crop, the gizzard and the intestine were dissolved in 10% KOH. Everything was filtrated through a 0,45µm filter, which was studied under a microscope. Although the aim was focused around microplastics, a DLS test was also performed to possibly find nanoplastics. The result showed signs of a little up to none plastic particles.

The filter showed no apparent traces of micro plastics but instead contained for most parts small transparent beads and tiny fibers that were not yet dissolved by KOH. The result from the DLS-test however showed a very minimal amount of nanoplastics.

Öresundsgymnasiet (previous Allvar Gullstrand) in Landskrona

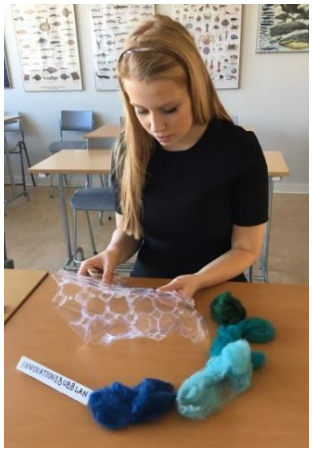
Building after Nature's Design

Teacher: Karin Warlin

Student: Fredrika Viberg

Sponsored by Dow Chemicals

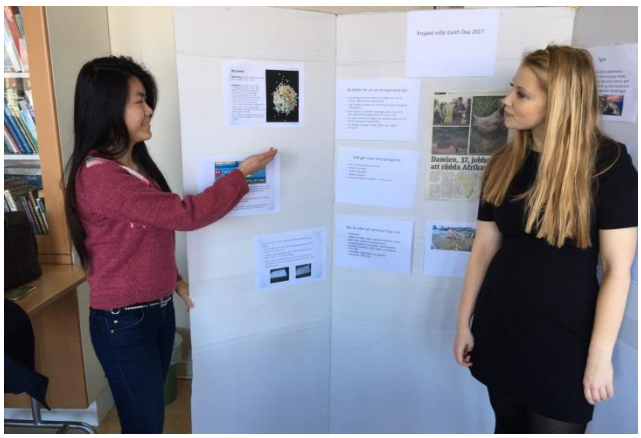
The idea of creating a house completely inspired by the design of nature, has made the project work *House of innovation* possible. By taking a closer look on some of the main challenges related to the global warming of today,(interviewing an architect and WWF experts) a new way of building was developed.



The idea of reaching a sustainable residence with both effective energy sufficiency and self-farming as well as

resistance against water rising and strong winds has lead to the choice of creating a round, transparent construction looking almost like a bubble and inspired by a green house. The transparent construction will with help from sunlight create a local based greenhouse effect which will be used for two reasons.

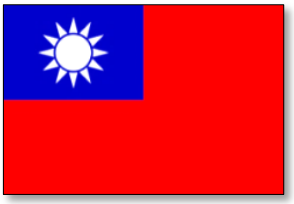
In order to decrease the global warming and higher global temperatures, creating a warmer local temperature could be one of the solutions while taking care of the benefits with a warmer local climate can facilitate growing seeds and greens on a local basis and minimizing transportation. The possibility of having an easy access to vegetables for each household can also lead to people eating more greens and less meat.



A warmer local temperature around each household can also decrease the amount of energy that is used for heating. In Scandinavia some studies show that between 40-60 % of all produced energy is used for heating buildings.

In order to create cities and households with resistance against water levels rising, the construction can also be placed floating on water. The oval construction minimizes impact from storms due to climate change. A model of this was made and displayed at an Innovation competition.

TAIWAN



Humanity Primary and Junior High School

Make a Recovery Plan for Ecological Ponds at School ~Save Native Species, Stop Invasive Species

Teacher: Yan-Jin(Ann) You

Students: Ching-Yun (Eve) Lu, Man-Ting (Gina) Lin, Syuan-Li (Jerry) Sun, Yu-Sheng (Yoyo) Chang, En-Ting (Nick) Lin

Partner Organizations: Teacher Yeh, Teacher Qiu, Yonghe Community University Fuhe Wetlands Ecology Educational Park

Once we walked around our school. We found that our ecological pond became worse. But they were beautiful and lively before. We found that some invasive species grew out of control. They took over an entire area and chased out some native plants. They stopped the water flowing and almost killed all of the native species. They are a threat to our ecosystems of the pond. As a result, the ecological pond becomes dirty and stinky. These results are not what we wanted nor expected. Therefore, we want

to make a recovery plan to stop invasive species.

We cooperated with Teacher Yeh because he was the original designer for the ecological pond in our school. We invited him for coming back to teach and lead us. In addition, we cooperated with Yonghe Community University members because they managed Fuhe Wetlands Ecology Educational Park for a long time. They promote wetland environmental education. So we contacted with them and had a tour guide for ecosystem in wetlands. The volunteers there showed us many kinds of native aquatic plants and discussed how to manage ecological ponds with us.

To begin with, we ask Teacher Yeh to teach us a lot of professional knowledge. We learned about Taiwanese native plants and invasive plants. Then, we observed what happened with the ecological pond. We listed the problems that we had to face.

Furthermore, we recorded the type of the ecological pond and what kind of biological lives there. We analyzed the advantage and the limit of the pond. Finally, we consulted with Teacher Yeh and started to clean strongly invasive plants. In the future, we want to submit a proposal to the school about the management of the ecological pond. We hope that the ecological pond will maintain biodiversity for a long time.

Stella Maris Ursula High School

Live with *Mola mola* –Make Good Use of Sunfish in Food and Tourism

Teacher: Fu-Tsung Hsieh

Students: Yueh-Min Chen, Zhao-Yu Tu

Partner Organization: S'Agulla, Yanliao Seafood Restaurant, and Jia-Fong Set-nets

Sunfishes *(Mola mola),* listed in vulnerable species in the IUCN Red List by International Unions, are one kind of the major marine lives at the Chihsingtan seashore. Sunfishes are usually captured with the set-nets along the seashore. The traditional dishes are made of intestine of sunfishes. Because of the overfishing problem, sunfish's population is decreasing. Local residents are forced to creating new dishes by making good use of the limited number of the captured sunfishes. We aim to investigate the different ways of tasting sunfishes and how they are served in local restaurants.

Besides being delicacies on the dinner table, we found that sunfishes are also attractive to the divers in other nations. Because of the strong current, diving here is dangerous. Diving is forbidden. Thus, we are aiming to design three-dimensional glasses with the sunfish logos, record the spectacular scenery of Chihsingtan and

make it into panoramic photos and movie clips, hoping of introduce the living environment of *Mola mola* and educate people to preserve sunfishes.

Above all, we knew that we needed to investigate how *Mola mola* is catched, do surveys on their varieties dishes and the related souvenirs. Therefore, to have a complete view of *Mola mola*, first we participated in the Ocean Project set by iEARN, obtaining the basic knowledge of oceans. We also tried to broaden our vision of *Mola mola* industry by visiting and interviewing the local museums and the owners of the restaurants selling sunfish dishes.

We want to remind again of the fact that *Mola mola* and us are living together on Earth, so we also hope to design hair pins using the shape of *Mola mola*. Lastly, we'd like to present our thoughts to the students in our school after finishing this project.

Stella Maris Ursula High School

Sustainable Dried Fish Industry for Local Ecology

Teacher: Yu-Hsiang Huang

Students: Yen-Cheng Chang, Wei-Ching Chang, Yin-Hung Lin, Yi-Lin Lai, Jun-Hao Wang

Partner Organization: Chishing Tan Katsuo Museum

Dried Bonito is popular food in Hualien and it is made of Bonito coming with Kuroshio. The dried Bonito industry started when Taiwan was colonized by Japan and it flourished for decades. As residents close to the seashore, we are interested in the development of dried Bonito industry and how it can influence the local ecology. We aim to investigate the process of making dried Bonito by collaborating with Chishing Tan Katsuo Museum, understand how the fishing method influence the local ecology, and study how to improve the sustainable development of the dried Bonito culture. Here, we conducted the following researches.

We visited the Chishing Tan Katsuo Museum. In the museum, we learned the live cycle of Bonito, and its population is significantly influenced by overfishing. Moreover, we do field study at set-nets, fishing markets and the local port. Obtaining the information provided by the staff in the museum and the local fishermen, we conclude the population of Bonito shrinks rapidly in those years and the decrease in mainly caused by purse seine. However, the local fishing industry is essential for local business. Therefore, the method of set-nets fished is beneficial both to the environment and the industry.

As a result, we propagated advantages of set-nets' in three ways. First, we set a website summarizing our studies and made a video how to make contributions to preserve Bonito population. Second, we went to the downtown of Hualien to promote that set-net is better than purse seine. Last, we cooperated with the museum and tried to trace the origin of fished Bonito.

Within a few months, we got 1245 reads on our website and video, people on the street appreciated our doings, and the museum agrees of the idea of the labelling the origin of dried Bonito on their products.

TURKEY

Saint Michel French High School and Notre Dame De Sion French High School

The Adventure of Olive from Sapling to the Table

Teacher: Inci Kimyonsen, Seval Erol

Students: Serra Atilla, Selin Elvan Taspinar, Derin Poroy, Berkin Toy

Partner Organizations: Ayvalik Municipality, Public Education Center

According to the legend, Homer got tired whilst traveling along the coast of the Aegean sea and sat under the shadow of an olive tree. The olive tree started to talk and thus whispered to his ear: "I belong to everybody and to no one. I was here long before you arrived and I will be here long after you are gone".

The olive tree is amongst the rare trees that can live for centuries without the aid of the human race. Thus, it is known as the symbol of eternity. Therefore, the olive tree represents sustainable life on its own.

With its spiral trunk and roots that strongly bear the earth, everything about the olive tree; such as its leaves, fruit, pulp, oil and seeds; are of use to us: there is no waste. The tree, which is growing and forming new roots on and on, deserves to be named "The Immortal Tree."

Olive tree grows in around 40 countries around the world but mostly in the Mediterranean region, and in Anatolia. Olive is well-known in many countries. It has its place in mythology, literature, arts and the holy scriptures.

Olive is the most suitable plant to add value to national economies. Therefore, the students from Sustainable Life/ Environment clubs of Notre Dame de Sion Private High School and Saint Michel Private High School visited the bay of Edremit to observe the whole adventure of olive from a young tree to a table.

The students from both high schools put cloth beneath the trees and began harvesting. They collected olives with both traditional and modern methods. The harvested olives were then put into sacks and boxes to be transferred to oil factories.

The students visited different local olive oil factories and got informed on wet pression soap production and the bottling methods. They had the opportunity to observe the climate, products and the social life in the bay of Edremit.

The target of this study is to get informed about and to practice olive production, conservation of plantation and the entire prospect of the olive utilization for the economy.

This project was photographed through the lenses of two professional nature photographers and the rural life was brought into our city lives by an exhibition in our schools. This study gave another perspective to our students' relationship with nature and it also evoked the awareness for the production and consumption of organic food.

Marmara Private High School, TED Istanbul College Foundation Private School

"STOP FOOD WASTE" Campaign

Teacher: Sedat Toy, Nurten Selda Mersinlioglu

Students: Idil Turk, Deniz Tasbicen, Goksu Sonmez, Lara Unal

Partner Organizations: University of Maltepe, Municipality of Maltepe

The U.N. Food and Agriculture Organization (FAO) estimates that 1.3 billion tons of food are wasted annually. With over 870 million people suffering from food insecurity and hunger, why is it that 30-40 percent of food is lost or ends up in landfills?

Like it or not, when it comes to food waste, it is not just industrial farms or supermarkets or restaurants or caterers or other people who are to blame: It is all of us. Consumers, we are the main food wasters.

Realizing that, we agreed on to start a "Stop Food Waste" campaign to raise awareness about food waste to ensure that people take measures. First of all, we met and interviewed with the customers of retail markets, the manufacturing and delivering companies, the farmers producing food and learnt about the problems and discussed about the solutions.

We worked in cooperation with the partner schools, retail markets, manufacturers, municipalities and universities through online and face-to-face surveys intended to shock people into awareness of the magnitude of consumer food waste and the personal costs we incur when we throw food away.

We also learnt about the production stage by carrying out agricultural practices in the school. We cooperated with the municipalities to talk about the perspectives of the people and how we would develop perspectives.

We promoted public awareness via social media channels. In addition, we provided trainings for students in the schools. Furthermore, we prepared posters suggesting tips on how to reduce food waste and posted them in the school cafeterias.

Saint Joseph French High School

Green Chain – Fenerbahce Community Garden

Teacher: Sukran Ince Toy

Students: Cerensu Glumus, Bengisu Duygu,

Yasin Tuna Kursunlu

Partner Organization: Kadikoy Municipality

A Community Garden is a piece of land gardened by a group of people. Community gardens provide access to fresh vegetables as well as access to satisfying labor, neighborhood improvement, sense of community and connection to the environment. They are publicly functioning in terms of ownership, access and management, as well as typically owned in trust by local governments or nonprofits.

Last year, we constructed our Fenerbahce community garden, in the middle of the Istanbul Metropolitan. This year, we extended our project to a wider area, added new parts to our garden, reached out more people by making new connections to form a wider network. Students, universities, non-governmental organizations and volunteers work together to form a green food chain, to learn the stages of food production, to understand the relationship between soil and food production, to plant seeds, to harvest the crops and to work together and most of all, have fun.

Our community garden, situated in the most beautiful location of the city, is available for planting in the summer and winter and serves as a workshop in continuous operation. Composting also provides sustainability in agriculture by making recycling, providing food to those who need it, producing and storing natural seeds, and drying and preserving vegetables with natural methods.

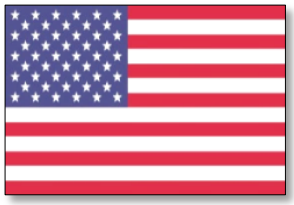
We carry out all these activities together with our school's volunteer students, project coordinator teachers and administrators together with Kadıkoy Municipality and volunteers.

We organized many educational activities to include school students from kindergarten to university.

The social networks established by our students helped us to provide more interest to our work as well as more participation of new volunteers from a wide variety of backgrounds (age, race, culture, social class).

We really enjoy the garden workdays, and coming together and meeting everyone with a common passion!

USA



Early College High School

Meating Nature's Standards

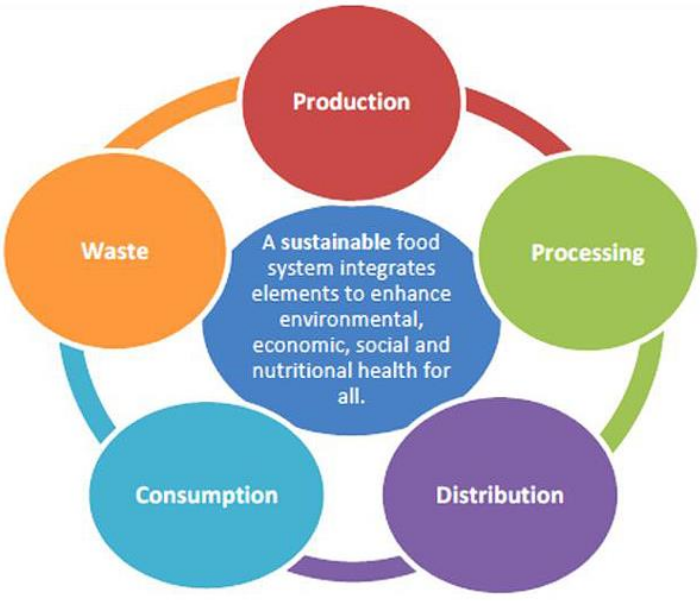
Teacher: Dan Hoynacki

Students: Andrew Bond, Benjamin Bond, Kevin Garcia

Partner Organization: OSU Extension

Our project focuses on raising awareness of the unsustainable food systems in our society. The three topics that we view most impactful are environmental impacts, health impacts, and the treatment of animals.

Environmental impacts include the use of agrichemicals in farming, overgrazing, and clear-cutting. Overgrazing and clear-cutting are tied together in that the constant overgrazing leads people to cut down forests in order to make new room to graze. The agrichemical use allows the chemicals to leech into ground water, and make its way downstream, where it can harm wildlife.



The health impacts that we chose to focus on include the lack of nutrition in foods due to processing, and the high amounts of fats and sugars in our foods. These are harming our population, and leading to many health issues and deaths.

Finally, the treatment of animals is a big problem. This includes how many animals are crammed together, which leads farmers to use antibiotics in order to keep them healthy. Not only are these antibiotics potentially harmful, but they can also produce viruses that are more powerful, which leads to a constant need to keep making more powerful antibiotics.

For the environmental impacts, we chose to focus on advocacy. However, for the health issues and the treatment of animals, we wanted to show people how they could change their eating habits, while improving animal treatment. This includes going vegetarian and vegan. In order to show that these changes aren't as difficult as perceived, our group went vegetarian for a while, and then went vegan for a while. This allows us to show the public that it can be done with some effort.

Early College High School

The Community Cob Wall Initiative

Teacher: Dan Hoynacki

Students: My'chaela Maine and Brent Preston

Partner Organization: OSU Extension

Our project happens to be the legacy project for this

year's conference. We are constructing a cob wall over at the local Youth Farm to serve as a wind barrier for the crops as well as alternate housing for birds and insects that live in the area surrounding the farm. A cob wall is primarily made of clay, sand, and straw mixed with water to create a very sticky substance that will harden to be almost as strong as cement. Cob is an all organic material which is very fitting considering that the youth farm is all organic and uses no chemicals for their crops. Our plan, as far as alternate housing goes, is to implant bee tubes that will allow mason bees to colonize in the wall as well as installing bird houses into the cob directly during construction. Since we are building this wall in an L shape in addition to making it eight feet tall, we will be able to provide supreme wind protection for the crops that are going to be growing in that plot of land. Right now there is going to be onions and strawberries growing there but through the seasons, crops are rotated to keep the soil fertile. Hopefully by the end of the conference, we will have the whole 16

by 30 foot wall completed with the exception of maybe the added roof to protect it from erosion. As of right now, we have a footing dug and we have laid some gravel.

Early College High School

Agricultural Education for Youth

Teacher: Kelly Noack

Students: Andy Domingo, Karen Garcia, and Ruby Pascual

Partner Organization: 4-H Youth - OSU Extension Service

Our project focuses on raising the amount of exposure elementary school students have with agriculture including starting and maintaining a garden. We taught

four lessons at Washington Elementary School in Woodburn, OR. Each lesson was taught to two different groups: one consisted of students in Kindergarten through the second grade and the other of third to fifth grade students. The four lessons we hosted covered the topics of indoor gardening, pesticide-alternatives, pollinators, and decomposers.

During the lesson on indoor gardening, we presented to the children many different plants that were ideal to start out with. We also showed them a quick and easy way to build an indoor garden out of water

bottles. For their activity that day, we helped the kids plant a couple seeds of their choice in an egg carton to give them an example about recycling in the gardening environment.

The lesson about pesticide-alternatives consisted of us teaching them what a weed is, what pesticides are, the harms pesticides have in our environments, and how to get rid of weeds. We also had the children help us make a pesticide-alternative out of baking soda and vinegar. We then had the kids spray it on the weeds in their garden.

For the lesson on pollinators, we showed an example of how pollinators spread pollen and talked to them about why we need the pollinators for our food. We then went out into their garden and pulled weeds from their beds.

During the lesson on decomposers we talked to them about what decomposers do and why we need them. We had a compost bin with worms in it, so we showed them the phases of decomposing and how the worms helped with that.

We are currently working on a fundraiser to be able to buy some pollinator-friendly plants to donate to Washington Elementary School, which we hope to help plant soon.

North Salem High School

Oak Savanna Education and Restoration

Teacher: Emily Parent

Students: Jennyfer Trejo & Stephanie Godinez (not attending conference)

Partner Organizations: Nature Conservancy & Heritage Seedlings

We started our project by conducting **research** to better understand the importance of Oak Savanna in Oregon. Through our research we found out that Oak/Savanna once dominated the Willamette Valley, but now are so rare that many of the species associated with these ecosystems are endangered or at risk for becoming endangered, such as Fender's blue butterfly.[1,2] We also discovered that Oak Savanna provided food, fuel, and fiber to the native Kalapuya people in the valley, who relied on camas, tarweed, acorns, and other prairie plants as a major part of their diets. These prairie habitats were so valuable that the Kalapuya literally used fire to maintain them. Without fire, many other woody species and trees have encroached on the Willamette Valley land, including many invasive species.[3]

Now much of the remaining Oak Savanna habitat in Oregon is on private land. Thus, the second part of our project has been to develop **partnerships** with individuals invested in the protection and restoration

Jefferson Farm

of Oak Savanna.

Our primary partnership is with the Nature Conservancy. We visited their Noble Oaks Preserve on May 11th, 2017 and Matt Benotsch took us on a tour of the site. We also helped with a fence removal project at the preserve on May 13th, 2017. Another partner is Heritage Seedling's scientist Lynda Boyer who took us on a tour of restoration site in Jefferson on April 18th, 2017.

Fence Removal

The final part of our project is **education and outreach**. So far we have been able to talk to the public about restoration and oak savanna at two different events- a plant sale on May 6th and a conference on May 24th. We hope to continue this project by involving future students in working with Nature Conservancy on the Noble Oaks site.

1. http://www.fsl.orst.edu/pnwerc/wrb/Atlas_web_compressed/4.Biotic_Systems/4b.presetveg_web.pdf
2. https://www.fws.gov/oregonfwo/promo.cfm?id=177175701
3. https://www.oregon.gov/ODF/Documents/ForestBenefits/OregonWhiteOak.pdf

Early College High School

Tobacco and Drinking Water

Students: Rafael Arrezola & Tapiwa Kapurura

Problem: Many people often throw their cigarette butts on the ground when they're done with them. Cigarettes being un-biodegradable have the capability of staying on the ground for up to 25 years. The chemicals a cigarette will often be leached out into bodies of water such as oceans, lakes, rivers, streams, creeks and more. These chemicals include arsenic, acetone, ammonia, lenience, cadmium, formaldehyde, lead, and toluene. These chemicals are very harmful to marine wildlife because they are not part of the ecosystem.

Solutions: International coastal cleanup day which involves more than 500,000 Volunteers picking up debris from beaches, rivers, and streams around the world.

Caretakers – Sing Along

Caretakers
We are the caretakers
Come and sing with us
We are the caretakers

We can't run
We only got one earth
We got one chance
To make it better

And we all swim across the sea
The sea of hope
The sea of freedom

Caretakers
We are the caretakers
Come and sing with us
We are the caretakers

Everyday
Men as you and me
Why can't they sing?
We are responsible!

And take my hand
Let's sense Mother Earth
Watching this to keep on living

Caretakers
We are the caretakers
Come and sing with us
We are the caretakers

And we all swim across the sea
The sea of hope
The sea of freedom

Caretakers
We are the caretakers
Come and sing with us
We are the caretakers

Video available on Youtube
http://youtu.be/9q5NhT_2Hf8

CARETAKERS OF THE ENVIRONMENT INTERNATIONAL/ PORTUGAL - 2016/2017 IN REVIEW

Fátima Matos Almeida

- CEI Vice-president

Associação Portuguesa de Educação Ambiental
Caretakers of the Environment International/Portugal
Earth Charter Affiliate

A) VOLUNTEERING A whole program of volunteering taking place since March, on the last Sunday of every month, has provided opportunities for all those who think they can act positively for the planet, either planting trees, action for the eradication of alien weeds or cleaning beaches.

B) EDUCO2CEAN – is the name of an Erasmus + project on the theme of the Oceans, coordinated by ASPEA. Besides Portugal, CEI/Poland, Spain and the UK are part of the partnership. Past May the partners met in Edinburgh and it was interesting to see Tony Salamon, and reckon that CEI members can cooperate in other international projects and jointly work in Educo2ceans in order to create a meeting point for students, educators and stakeholders about biodiversity and conservation of the marine environment, educational material available on-line specifically for this purpose in e-book format and other multimedia tools such as blogs and forums for videos, to enable the encounter, communication and exchange of ideas between the educational communities of different European countries.

A clean-up activity on the beach

C) ECOLOGICAL FARM of MOITA – since 2014, 16 hectares of land has been used by ASPEA to develop a varied program of organic farming, ecotourism, pedagogic beehive keeping, traditional buildings in adobe, environmental education, cultural activities and volunteering.

The activities on the Ecological farm - concerts with young musicians of the National Conservatory of Music

All year long we welcome families, school groups and young trainees from European countries. For the second time, a group of students from Huey Deng High School, Yilan, Taiwan, will work on the farm for around 10 days in July/ August, 2017. We are sure they will enjoy their stay in Lisbon and in Aveiro as much as last year.

D) 3rd European Youth Conference in Lisbon, 23-26 May, 2017. The European Youth Conference will be hosted by ASPEA/CEI Portugal in Lisbon. The participants will be 5 to 10 delegates from the following partner countries: Belgium, Lithuania, Georgia, Denmark, Portugal and Romania, Spain, France, Italy and Turkey, each group being chaperoned by 1 to 2 adult teachers. There will be in total 70 delegates, 14 adults and 10 facilitators and around 20 national coordinators, plus guests, program experts and organisers, in a total of approximately 150 participants.

E) III Portuguese Speaking Communities Congress on Environmental Education

CEI/Portugal has put its expertise at the service of the Government of the Principe Island, Africa, to jointly organise this congress which will take place on 17-20 July. This event is organised every 2 years in different countries and aims at creating room for learning, sharing, experiencing, and working together using a common ground - the language (Portuguese) and the love for Planet Earth.

F) ECOTOURISM in the Azores Islands in August, 2017

"Travelling in our homeland" is a program ASPEA has started a long time ago with the aim to promote ecotourism, as well as environmental awareness and cooperation between visitors and local communities. The geological feature the Azorean islands and how the hardships its inhabitants had to endure over the years will be one of the main highlights of this trip.

SUMMING UP

These are just some of the actions/ activities ASPEA. CEI / Portugal is engaged in. As an organisation we depend on the organisms/ people who are willing to work together putting their skills, competencies, creativity, motivation and love for nature and humankind at the service of all. Our work started 27 years ago when we founded ASPEA as a NGO and was largely inspired by the CEI spirit. However, over the years, our target groups has enlarged and nowadays we touch children, youth, adults, schools, companies and various institutions in the pursuit of more sustainable, engaged, responsible, just and happy communities.

The Convention on International Trade in Endangered Species (CITES)

Isabel S. Abrams is a journalist and also co-founder of CEI in 1986. In this article, she shares her learning from the amazing trip in Africa with her daughter. These photos were taken by Isabel's daughter Laurel Neme.

Isabel S. Abrams & Laurel Neme

Isabel S. Abrams

On September 25, 2016, I arrived at the Sandton Convention Center where 4000 delegates from 182 nations were negotiating treaties on the protection of rhinos, elephants, and many other animal and plant species. At various sessions, speakers described the habitats and lifestyles of these living things; how poachers behave; and the laws and science needed to stop the illegal trade that threatened many of them with extinction.

The Tiger Session

The speaker from India said that there were only 25,000 tigers in the world and half of them lived in India. He added that there were few protections for this iconic animal. Like many other poached animals, this endangered species financed terrorism, drugs, and human trafficking.

Tigers were valuable targets for poachers because the skin was a favorite for rugs and other parts as tiger wine, or tiger bone glue - used to treat bone maladies and sex problems. Tiger farming took place in countries such as Viet Nam but wild tigers were cheaper than farmed animals. Poachers killed the wild tigers by poisoning the waterhole, then made huge profits in trade with countries such as Vietnam, Laos, Myanmar, Thailand and Malaysia.

In 1973, Project Tiger began, with the idea that you can't save the tiger if you don't save the forest. Nevertheless, 770 tiger crimes occurred between 2010 and 2016. Law enforcement was mild in 43 live tiger cases and 24 frozen tiger cases: only 2% of the cases punished. Why? Because tiger owners at private farms and zoos claimed they were conserving tigers. Also, there was little or no management of captive tigers, so uncontrolled breeding and tiger deaths were not reported. There was even a case where a known tiger trafficker was given a permit to trade and import tigers.

The speaker quoted Abraham Lincoln, "The law without enforcement is only good advice," and concluded by saying," Tiger farms need to be closed and the public must report tiger crimes."

The Pangolin Session

Because many in the audience knew very little about pangolins, the speaker began with the biology of these small mammals. They were covered with scales, inhabited forest and grassland; and preyed on insects at night. Females gave birth to one offspring each year and they were very vulnerable to predators. In the wild, pangolins had a 20 year lifespan even though they were solitary and hunted in large home ranges.

Pangolins may carry germs that cause African Sleeping Sickness, malaria, worms, and ticks and cause zoonoses (diseases spread from animals to humans). However, in Africa, pangolins are used for cultural rituals and traditional medicine.

Loss of habitat, pesticides, and electric fences kill pangolins, but the main threat is poaching, They are the most trafficked mammal; killed as a bush meat delicacy for royalty; and for their scales which are an ingredient in wine, jewelry, and traditional medicine. Illegal trade of 2 tons of scales last year, was used to treat cancer, skin problems, athletes foot, impotence, fertility, broken ribs, inflammation of naval; and to heal premature babies in Asia, and countries such as Cameroon, and Syria. As a result, the population of Chinese Pangolin declined by 90% and Giant Pangolin by 40%.

Commercial farming of pangolins is not viable because many die in the first month of captivity. They reject the artificial diet and are so stressed that their scales are of poor quality and they are hard to breed. A full grown pangolin is small and weighs 1.8 kg, mostly because of its scales. When shipped, the pangolins are packed alive in small cages and many die.

Only 10% of illegal trade is intercepted in countries such as Cameroon, Kenya, Uganda. Zimbabwe tries to protect pangolins, but there is a lack of enforcement police.

Zimbabwe's Efforts

A woman from The TIKKI – Hywood Trust, an NGO with the mission to conserve Zimbabwe wildlife, fight rhino and ivory crimes; also worked for 20 years fighting pangolin poaching. She said it was a difficult task, because there were only 7 sightings of wild pangolins over the last 30 years. In 2016, Zimbabwe had an increase in pangolin poaching by individuals from Mozambique, Zambia and South Africa.

Zimbabwe has the most severe punishment for rhino crime: $15,000 US dollars and 9 years in jail. And bail is denied to poachers of specially protected species.

How does Zimbabwe defend its wildlife? By trying to strengthen cross border ties and by educating and empowering the public. Government and the public work together because, according to an old saying, "Sticks in a bundle cannot be broken."

Wildlife Forensics (Science used to solve crimes against animals and plants)

Delegates from TRAFFIC, the Society for Wildlife Forensic Science, US Agency for International Development (US AID), the U.N. Office on Drugs and Crime ((UNODC), and TRACE: members of the Wildlife Forensics Network, reported on the many ways forensic science can assist in combating wildlife crime. How? - By providing rangers and lawyers with scientific evidence from crime scene to courthouse.

The program director of Wildlife Forensic Science at TRACE talked about science tools such as morphology (identifying the body), chemical tests and DNA testing to identify the victim or body part (such as rhino horn or elephant ivory) and trace its background.

Traceability tools were essential for monitoring endangered plants, as well as land and sea creatures so investigations began with Species ID (Identification). For example, scientists determine if a piece of forest timber is an endangered species; or whether a feather, bone, or tusk is from a captive or wild caught animal; and where the specimen comes from. They also use traceability tools to find out the population assignment (which group is critically affected). For example, by matching samples, investigators distinguish a black rhino horn from a white rhino horn; or an Asian elephant tusk from an African elephant tusk. Then the

investigators try to match the sample to the crime scene.

A Wildlife and Forest Crime Analytic Tool Kit was a valuable tool because it provided information about collecting, analyzing and interpreting evidence. A University of Washington video with Interpol advisors helped train rangers and other personnel. And a Biomaterial Preserve, with samples from the past and present, was an important source for sample identification.

Speakers also mentioned such things as cheetah genomics and cheetah passports to stop illegal trade. Then they stated what is urgently needed:

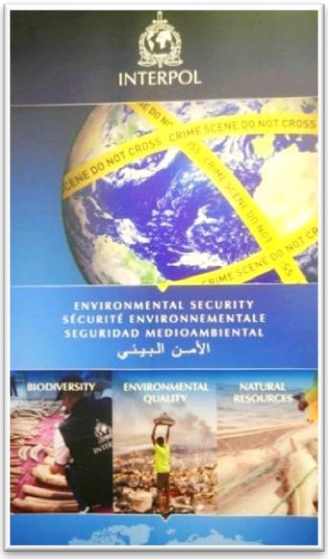
-better methods and international standards for DNA testing

- improved ways to send samples internationally

- strengthened wildlife forensic networks.

- stronger laws against wildlife crime.

They concluded by calling for better enforcement by trained investigators, laboratory forensic staff and prosecutors; and more networks of forensic services and cross border intelligence. That was the pathway way for providing stronger evidence and get stronger penalties.



Interpol

At a session sponsored by Interpol (the International Police Force), I learned that in Somalia, they work on cheetah, lion, ivory trade, and reptile crimes. In Switzerland, they work on rosewood. In short there were lots of endangered species and a range of issues so, in addition to anti-poaching activities, they were involved in environmental education, building databases for wildlife enforcement and studying evolving crime trends.

Interpol was a leader in intelligence enforcement, with the help of the Animal Forensics laboratory in Ashland, Oregon and dogs like those on boats that are trained to smell whale dung, and scientists who do DNA and isotope analysis. Interpol's mission was enforcement of wildlife laws so, when possible, it cooperated with Civil Society - Non-Governmental Organizations (NGOs), academics, the private sector and industry.

Press conference with Botswana's Minister of Environment

Tshekedi Khama, Minister of Environment, Wildlife and Tourism, said that Botswana has more than 35% of the elephants in Africa. However, many of these animals have come from other nations and hunting is a big problem because other African countries want to continue trade in ivory.

"We haven't seen the benefit of ivory sale. It was a legal sale and it created a desire for the illegal," said the Botswana Minister.

"We don't look at elephants' tusks and elephants separately," he said, and he explained that $1.5 million in tourism is earned over an elephant's life. "If we lose the resource, where will be the tourism?" he asked

Hunting is illegal in Botswana and Minister Khama encourages communities involved in tourism to think of sustainability, but he wished he could have more help from neighboring countries.

Minister Khama claimed Africans are responsible for their own resources. And reminded the audience that, after all, poachers are Africans.

He warned that, if we don't act now, poachers will point guns in our direction…."

He concluded by saying, "We talk about humans and wildlife coexisting. These elephants are worth fighting for… We are their voice."

During this trip to South Africa, I learned that forensic science and the treaties of CITES provide powerful weapons for stopping the killing and illegal trade of endangered plants and animals. I hope countries around the world will use them to protect their natural treasures now, and in the future.

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CEI OREGON CHAPTER

Celebrating 15 Years: Youth Enviro Squad & CEI Oregon

In 2002, Dan Hoynacki, Oregon State University Extension Service – Marion County – Sustainable Communities was engaging his first students in his afterschool environmental science and service learning program. They loved it and kept saying, "You MUST meet our teacher, Ryan Kinnett!". The youth finally introduced these two guys at an Earth Day event. The rest, as they say, is history.

Together, they have engaged more than 8000, mostly underserved youth in education and service learning, at least 4000 of them in multiple events and activities – many for several years. This collaboration translates to over 120,000 hours of environmental science –based service learning and engagement in community.

Oregon's first CEI conference was Greece 2004, although Ryan took youth to Japan in 2000 in a similar program. They stepped up and hosted the annual event in 2005. Since, then, over 100 Oregon youth have participated in CEI. In 2015, Dan and Ryan took over the reins of CEI/USA. As the both embark on new career paths, we look forward to an exciting future for CEI.

This has been a multi-generational partnership, for sure. Ryan and Dan almost always seem to click on how to tackle challenges, and have always shared a similar vision for the role of youth in the environment, their community, their future.

Preview for CEI 2018 Austria

The 32nd CEI conference will take place from the 8th – 14th July 2018 in Judenburg/Austria. The conference will be hosted by CEI Austria branch and the Bundesgymnasium und Bundesrealgymnasium Judenburg.

The theme of CEI 2018 conference "Let's Experience Nature" should give all participants and caretakers the possibility to observe the change in our nature from different perspectives and point of views. Many workshops, fieldtrips, outdoor activities, social, cultural and sports activities will be integrated in the programme to experience Austria's nature on site.

The hosts Johann Mischlinger, Ilse Prenn and Bernd Fiechtl invite all caretakers to come to Austria to pass another CEI week sharing ideas and experiences.

Johann Mischlinger, Ilse Prenn, Bernd Fiechtl

CARETAKERS
OF THE ENVIRONMENT INTERNATIONAL (CEI)

Caretakers of the Environment International

The CEI is an independent organization established in 1986, embracing secondary school students, teachers and mentors, whose interests are focused specifically on the issues of environmental protection, promoting education, shaping awareness and training within sustainable development.

31st CEI Conference Salem, Oregon U.S.A. July 1-8, 2017