

2014

Environment Abstracts

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Symposium on Environment
12-15 May 2014, Athens, Greece

Edited by Gregory T. Papanikos

THE ATHENS INSTITUTE FOR EDUCATION AND RESEARCH



Environment Abstracts
9th Annual International
Symposium on Environment
12-15 May 2014, Athens,
Greece

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Preface

This abstract book includes all the abstracts of the papers presented at the 9th *Annual International Symposium on Environment, 12-15 May 2014*, organized by the Athens Institute for Education and Research. In total there were 28 papers and presenters, coming from 15 different countries (Albania, Algeria, Austria, Brazil, Canada, China, Cyprus, India, Iraq, Libya, Mexico, Qatar, South Korea, Turkey, USA). The conference was organized into 7 sessions that included areas of Environmental Impacts, Challenges and Solutions, Air and Water Pollution, Waste Water Conveyance, Water Quality and Treatment, Climate Changes and Laws, Biomass Utilization, Solid Waste and Residues Utilization, Energy and Fuels and other related fields. As it is the publication policy of the Institute, the papers presented in this conference will be considered for publication in one of the books of ATINER.

The Institute was established in 1995 as an independent academic organization with the mission to become a forum where academics and researchers from all over the world could meet in Athens and exchange ideas on their research and consider the future developments of their fields of study. Our mission is to make ATHENS a place where academics and researchers from all over the world meet to discuss the developments of their discipline and present their work. To serve this purpose, conferences are organized along the lines of well established and well defined scientific disciplines. In addition, interdisciplinary conferences are also organized because they serve the mission statement of the Institute. Since 1995, ATINER has organized more than 150 international conferences and has published over 100 books. Academically, the Institute is organized into four research divisions and nineteen research units. Each research unit organizes at least one annual conference and undertakes various small and large research projects.

I would like to thank all the participants, the members of the organizing and academic committee and most importantly the administration staff of ATINER for putting this conference together.

Gregory T. Papanikos
President

FINAL CONFERENCE PROGRAM
9th Annual International Symposium on Environment, 12-15 May 2014,
Athens, Greece
PROGRAM

Conference Venue: [Titania Hotel](#), 52 Panepistimiou, 106 78 Athens, Greece

ORGANIZING AND SCIENTIFIC COMMITTEE

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4. Dr. George Poulos, Vice-President of Research, ATINER & Emeritus Professor, University of South Africa, South Africa.
5. Dr. Nicholas Pappas, Vice-President of Academic Affairs, ATINER & Professor, Sam Houston University, USA.
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8. Dr. Stevan Gressit, Medical Director, Office of Adult Mental Health, USA.
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12. Dr. Arturo F. Castellanos-Ruelas, Professor, Autonomous U. Yucatan, Mexico.
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16. Dr. Matthew Kubik, Associate Professor, Indiana University, USA.
17. Dr. Abdul Jamil Urfi, Associate Professor, Delhi University, India.
18. Dr. Timothy Howe, Associate Professor of History and Ancient Studies, Saint Olaf College, USA.
19. Dr. Romana Elzbieta Pawlinska-Chmara, Assistant Professor, Opole University, Poland.
20. Dr. Behzad Sani, Assistance Professor, Islamic Azad University, Iran.
21. Dr. Ja'afar-Furo Muhammad, Lecturer, Adamawa State University, MUBI, Nigeria.
22. Dr. Eva Maleviti, Researcher, ATINER, Greece.
23. Mr. Fadi Al Jallad, Researcher, National Energy and Water Research Center, UAE.
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25. Ms. Rouska Bozkova, Ph.D. Student, South West University Neofit Rilski, Bulgaria.
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27. Ms. Eirini-Renata Dimitrokali, Ph.D. Student, University of Central Lancashire, U.K.
28. Dr. Nirit Bernstein, Research Scientist, Volcani Research Center, Israel.
29. Mr. Mehran Narimisa, Academic - Don, Azad University, Iran.
30. Mr. Vlasios Oikonomou, Researcher, University of Groningen, the Netherlands.
31. Mr. Vasilis Charalampopoulos, Researcher, ATINER & Ph.D. Student, University of Stirling, U.K.
32. Ms. Olga Gkounta, Researcher, ATINER.

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Konstantinos Spiropoulos & Ioanna Trafali

C O N F E R E N C E P R O G R A M

(The time for each session includes at least 10 minutes coffee break)

Monday 12 May 2014

08:30-09:00 Registration

09:00-09:30 Welcome and Opening Remarks

- Dr. George Poulos, Vice-President of Research, ATINER & Emeritus Professor, University of South Africa, South Africa.
- Dr. Gregory T. Papanikos, President, ATINER.
- Dr. Nicolas Abatzoglou, Head, Environment Research Unit, ATINER & Professor, Department of Chemical & Biotechnological Engineering, Université de Sherbrooke, Canada, Chair Pfizer, PAT in Pharmaceutical Engineering, Director GREEN-TPV and GRTP-C & P.

09:30-11:00 Session I: Environmental Impacts, Challenges and Solutions (Room C)

Chair: George Poulos, Vice-President of Research, ATINER & Emeritus Professor, University of South Africa, South Africa.

1. Andreas Kanarachos, Professor, Frederick University, Cyprus. Building Retrofitting Using Hierarchical Optimization and Principal Component Analysis.
2. John Sansalone, Professor, University of Florida, USA. Quantifying the Viability of Green Infrastructure and Sustainability Practices.
3. *Ghanshyama P. Patankar, Associate Professor, Karnataka University, India & Mohammad Rafique N. Meeranaik, Associate Professor, Karnataka University, India. Environmental Degradation and its Impact on Water Pollution of Uttara Kannada District, Karnataka State-India: A Geographic Approach.
4. Keshav Deshmukh, Principal, Sangamner Nagarpalika Arts, D.J. Malpani Commerce & B.N. Sarda Science College, Sangamner, Dist. Ahmednagar, Maharashtra State, India. Effect of Gypsum on the Chemistry of Saline – Sodic Soils of Sangamner Area, Ahmednagar District, Maharashtra, India.
5. Riyadh Abdullah Fathi, Professor, University of Mosul, Iraq. Detection of Uranium Contamination in Acacia Cell Sap by Capillary Zone Electrophoresis (CZE) Technique.

11:00-12:30 Session II: Air and Water Pollution (Room C)

Chair: Dr. Nicolas Abatzoglou, Head, Environment Research Unit, ATINER.

1. *Val Jo Anderson, Professor, Brigham Young University, USA. Air and Water Pollution Resulting from Worldwide Overgrazing and Degraded Rangelands: Is there a Fix? (Monday 12 of May).
2. Anila Mesi (Dizdari), Associate Professor, University of Shkodra “Luigj Gurakuqi”, Albania & Ditika Kopliku, Associate Professor, University of Shkodra “Luigj Gurakuqi”, Albania. Toxic Potency Evaluation of Metal-Doped River Water (Cr, Cu and Pb), on *Allium cepa* L. - An Albanian Case.
3. Arij Mousa, Assistant Professor, College of Medical Technology, Libya. The Cognitive Apprehensions Regarding Drinking Water among Educated Americans and Arabs Living in Middletown.

12:30-14:00 Session III: Waste Water Conveyance, Water Quality and Treatment (Room C)

Chair: Val Jo Anderson, Professor, Brigham Young University, USA

1. *Yimin Zhang, Director, Nanjing Institute of Environmental Sciences of Ministry of Environmental Protection of China, China, Yuexiang Gao, Assistant Professor, Nanjing Institute of Environmental Sciences of Ministry of Environmental Protection of China, China & Chuang Zhou, Student, Changzhou University, China. Purification Effect on Eutrophic Water with Combination of Plagiognathops Microlepis Bleeker and Different Benthos.
2. Ditika Kopliku, Associate Professor, University of Shkodra “Luigj Gurakuqi”, Albania & Anila Mesi (Dizdari), Associate Professor, University of Shkodra “Luigj Gurakuqi”, Albania. Capability of *Vicia faba* L. in Evaluating Surface and Waste Waters Toxicity of Shkodra Lake, Albania.
3. Yan Wang, Associate Professor, Shandong University, China & Yongbao Chu, Associate Professor, Qingdao University of Science & Technology, China. Controlling Disinfection By-Products (DBPs) Formation of Yellow River Water by Enhanced Coagulation in Summer and Winter.
4. *Nicolas Abatzoglou, Head, Environment Research Unit, ATINER & Professor, Department of Chemical & Biotechnological Engineering, Université de Sherbrooke, Canada, Chair Pfizer, PAT in Pharmaceutical Engineering, Director GREEN-TPV and GRTP-C & P. Sustainable Development and the Canadian BioFuelNet.

14:00-15:00 Lunch (details during registration)

15:00-16:30 Session IV: Climate Changes and Laws (Room C)

Chair: Yimin Zhang, Director, Nanjing Institute of Environmental Sciences of Ministry of Environmental Protection of China, China

1. Angelina Isabel Valenzuela Rendon, Director of Graduate Studies in Law, University of Monterrey, Mexico. The Damage to the Environment: A Sight from the Law.
2. Liza Powers, Doctoral Student, Texas Southern University, USA. Planning for Climate Change in the Port of Houston’s Turning Basin Terminal Development.
3. Muhibe Asli Alp, Researcher, Istanbul University, Turkey, Tefvik Hakan Altincekic, Professor, Istanbul University, Turkey & Alperen Kaymacki, Researcher, Istanbul University, Turkey. Potential Usage of Wood Polymer Composites in Landscape Design.

21:00–23:00 Greek Night (Details during registration)

Tuesday 13 May 2014

08:30-10:30 Session V: Biomass Utilization (Room C)

Chair: Ms. Olga Gkounta, Researcher, ATINER.

1. *Sofia Djerdali, Professor, University Ferhat Abbas, Algeria & Francisco Sanchez Tortosa, Professor, University of Cordoba, Spain. Anthropogenic Changes in Environment Causes Higher Productivity in the White Stork *Ciconia Ciconia* in Setif Area (Northern Algeria).
2. H. Huseyin Cebeci, Associate Professor, Istanbul University, Turkey. How to Save the Oriental Sweetgum, *Liquidambar Orientalis*, Forests: Some Problems on Conservation in Turkey.
3. Alperen Kaymakci, Researcher, Istanbul University, Turkey & Nadir Ayrimis, Associate Professor, Istanbul University, Turkey. Influence of Repeated Injection Molding on Some Physical and Mechanical Properties of Wood Polymer Composites.
4. Leticia Prevez, PhD Student, Paulista University, Brazil, Biagio Fernando Giannetti, Professor, Paulista University, Brazil, Cecilia Vila Boa Almeida, Professor, Paulista University, Brazil, Feni Agostinho, Professor, Paulista University, Brazil, Jose Sacomano, Professor, Paulista University, Brazil. Environmental Accounting of the Mango Productive Chain.

10:30-12:00 Session VI: Solid Waste and Residues Utilization (Room C)

Chair: Sofia Djerdali, Professor, University Ferhat Abbas, Algeria

1. Cemaliye Ozverel, Research Assistant, Middle East Technical University – Northern Cyprus Campus, Cyprus, Bertug Akintug, Assistant Professor, Middle East Technical University – Northern Cyprus Campus, Cyprus & Gulen Gullu, Professor, Hacettepe University, Turkey. Waste Composition in the Middle East Technical University - Northern Cyprus Campus.
2. Seul-Ye Lim, MSc Student, Seoul Tech, South Korea & Seung- Hoon Yoo, Professor, Seoul Tech, Korea. External Benefits of Waste-to-Energy in Korea: A Choice Experiment Study. (12 MAY 2014).
3. Mohammad A. Al-Ghouti, Assistant Professor, Qatar University, Qatar. Fly Ash from Power Stations: Characterization and Environmental Utilization.
4. Zeki Hassan, Assistant Professor, Mosul University, Iraq. Selection the Best Interpolation Method of GIS Technique for Mapping Spatial Distribution of Soil Properties of an Area Located at Northern Iraq.
5. Derya Ulutas, Student, Anadolu University, Turkey, Eren Bayrakci, Student, Anadolu University, Turkey, Zerrin Cokaygil, Professor, Anadolu University, Turkey, Aysun Ozkan, Assistant Professor, Anadolu University, Turkey, Yucel Guney, Professor, Anadolu University, Turkey & Mufide Banar, Associate Professor, Anadolu University, Turkey. Geotechnical, Chemical and Structural Characterization of Waste Clay from Boron Production.

12:00-13:00 Lunch (Details during registration)

13:00-14:30 Session VII: Energy and Fuels (Room C)

Chair: Ghanshyama P. Patankar, Associate Professor, Karnataka University, India.

1. Christina Krenn, Project Manager, STENUM GmbH, Austria & Johannes Fresner, STENUM GmbH, Austria. Integrated and Optimized Energy Management System. (Tuesday 13 May 2014)
2. Heather Thomson, Research Assistant, Delaware University, USA, James Winebrake, Professor, Rochester Institute of Technology, USA & James Corbett, Professor, Delaware University, USA. Total Fuel Cycle Analyses for Emerging Lng/Cng Fuels: a Comparative Energy and Emissions Assessment.
3. Aditya Prasad, Post Graduate Student, The WB National University of Juridical Sciences, India & T. V Prasad, Principal Architect, VKTS, India; M.Arch, Massachusetts Institute of Technology, Massachusetts, United States of America & VKTs, Bangalore, India. Bio Invasion through Ballast Water Discharge– A Review of the International Legal Framework.
4. Iraildes Caldas Torres, Professor, University of Amazonas, Brazil & Celso Augusto Torres Do Nascimento, Doctoral Student, Federal University. The Exploration of Oil and Gas in Amazonas, Brazil and the Impacts to the Environment and the Lives of Traditional Peoples.

17:30-20:30 Urban Walk (Details during registration)

21:00-22:00 Dinner (Details during registration)

Wednesday 14 May 2013

Cruise: (Details during registration)

Thursday 15 May 2013

Delphi Visit: (Details during registration)

Nicolas Abatzoglou

Professor, University of Sherbrooke, Canada

Sustainable Development and the Canadian BioFuelNet

Since the Brudtland Commission coined the term “Sustainable development” in 1987, our society concretized the need of finding ways to optimize all of its activities, without compromising the equivalent potential of future generations.

In this presentation, the author revisits the actual status of the sustainable development (SD) in the cases of industrial production and products consumption, and explains that, although all such activities are officially approved as respecting SD, the continuous pursuit of improvement is in essence SD.

Who talks about SD talks also about our efforts of decreasing the greenhouse effect gas (GHG) emissions; the latter is considered as the main culprit of climate changes. The Canadian government, recognizing the importance of replacing at least one part of fossil resources derived fuels by renewable ones, has launched in 2012 the National Network of Centers of Excellence, BioFuelNet, targeting the development of new and optimization of existing biorefining technologies. This network involves the combined R&D endeavours of nearly all Canadian researchers in this field. These university researchers along with collaborators from industry and government work towards a thriving advanced Canadian biofuels industry. Both thermochemical and biological conversion technologies are included in this endeavour. BioFuelNet is organized in four platforms: East, central, Prairies and West; and 4 themes: Feedstock production; Conversion; Utilization and SEES (Social, Economic and Environmental Sustainability). Technology transfer to the industry is a major success criterion.

Mohammad A. Al-Ghouti
Assistant Professor, Qatar University, Qatar

Fly Ash from Power Stations: Characterization and Environmental Utilization

Fly ash has received significant consideration concerning surface characterization, modification, disposal management and application for various uses. A complete physical and chemical characterization and utilization of the fly ash (FA) generated in the thermal power station was investigated. The analysis revealed that the FA contains major levels of V and Ni (0.71-3.1%) in addition to other metals like Cr, Cu, Mo and Zn. XRD analysis showed that PbSO_4 and $\text{Mg}_3\text{V}_2\text{O}_8$ are the most abundant minerals in FA. Therefore, enrichment factors these metals were estimated. Particle size distribution was performed using laser based technique and the D_{90} was 92.4 μm ; indicating a complete combustion of heavy fuel. SEM pictures obviously showed the carbonaceous nature of FA, crystalline phases of FA and the spherical shapes of the particles. Condensation of S and V oxides at high combustion temperature (1300 °C) was confirmed by the EDX analysis. FTIR analysis was also confirmed the formation of Fe-S complexes. A preliminary study was conducted using FA as solid adsorbent and it was, however, not potential as a modest specific surface area (3.0 m^2/g) and pore volume (0.02 cm^3/g) were reported for FA. Large fractions of valuable metals were extracted from FA using different media like acidic solvents; the maximum % extraction of metals was reported for 1.0 M HNO_3 . Migration of the metals to the environment is likely where significant amounts of the metals might also be leached by H_2O . Five geopolymers (GPs) containing different amounts of FA (0-42 wt%) were also studied. They displayed a high stability with maximum compressive strength of 22.4 MPa observed for GP containing 20% by vol. FA. In addition, the toxic effect of heavy fuel FA was considerably reduced using geopolymerization technology as confirmed from synthetic precipitation leaching procedure.

Muhibe Asli Alp

Researcher, Istanbul University, Turkey

Tevfik Hakan Altınçekiç

Professor, Istanbul University, Turkey

&

Alperen Kaymacki

Researcher, Istanbul University, Turkey

Potential Usage of Wood Polymer Composites in Landscape Design

In the city, outdoor elements can be characterized as a part of the city identity. As outdoor elements which are used in the city; limiters (walls and fences), sitting elements, sign panels, litter bins, cover coat items etc. can be listed. In the designs, materials for outdoor elements can have some features such as aesthetic, function, economic. Besides these features, durability, harmony with nature and recyclable are very important. In landscape designs, outdoor furniture's which will be located especially in urban areas, available materials with the technological developments have changed. In this context, wood polymer composites have decisive advantages in the material group which can be used in this aim. A wood polymer composite is any material made of more than one component. This makes composites different from the other multi component systems. Wood polymer composites offer a number of advantages such as high dimensional stability, ecofriendly, recyclable, durable against split, warp, insect and fungal attack. Aim of this study was to examine the usage potential and advantages of wood polymer composites in urban furniture.

Val Jo Anderson
Professor, Brigham Young University, USA

Air and Water Pollution Resulting from Worldwide Overgrazing and Degraded Rangelands: Is there a Fix?

Rangelands cover two thirds of the earth's land surface. They are responsible for a significant part of the world's primary and secondary production. A majority of the population from many nations of the world derive their subsistence from utilization of the renewable resources found on these rangelands. As populations have increased, particularly in the developing world, increased pressure to utilize rangelands past their capacity to renew, have created greater problems than lack of forage and localized hunger. As plant cover is reduced and soils are exposed, not only does food become an issue, but the dynamics of water flow and the quality of the water we drink and the air we breathe is directly impacted. This paper will present situations from many parts of the world where the author has completed research aimed at repairing damaged rangeland or reversing the destructive forces. Examples will be drawn from Morocco, Bolivia, Australia, China and the United States. Each part of the world provides its own set of environmental and social challenges which must be overcome to remedy the source of these destructive vectors. Methodologies, techniques, equipment and overall approaches will be explored along with an overview of successes and failures and the influences or circumstances that have contributed. The paper will conclude with suggestions of approaches to aid in combating these threats to the food we eat, the water we drink and even the air we breathe.

H. Huseyin Cebeci

Associate Professor, Istanbul University, Turkey

**How to Save the Oriental Sweetgum,
Liquidambar Orientalis, Forests:
Some Problems on Conservation in Turkey**

The oriental sweetgum, *Liquidambar orientalis* Mill., is a relict and endemic species in Turkey. This species distributes in southwest Turkey and Rhodos Island as natural range area. The sweetgum forests are ecologically and economically important because of having the oil (natural balsam) and contributions on biodiversity. The rapid human population growth of Turkey and associated demands on forests threaten the natural ecosystems. The distribution area of this species has decreased from 6312 ha to 1135.2 ha year after year due to farming, grazing, poor oil production, cutting and settling. The purpose of this presentation is to describe the primary problems on oriental sweetgum forests in Turkey. I will present: (1) the current status of these forests (2) the national objectives and priorities for forest conservation (3) actions needed to conserve biodiversity and sustainable utilization of these forests.

Keshav Deshmukh

Principal, Post Graduate Department of Chemistry, Sangamner
Nagarpalika Arts, D.J. Malpani Commerce & B.N. Sarda Science
College, India

**Effect of Gypsum on the Chemistry of Saline -
Sodic Soils of Sangamner Area,
Ahmednagar District, Maharashtra, India**

India is concerned to food security to meet the demands of growing millions of human population. The millions of hectares of land lying barren due to saline - sodic problem. It is important to maintain soil health for sustainable productivity, food security and increasing agricultural production for multiple demands against fast mounting pressure on limited soil resource. Several chemical amendments including gypsum have been tried to reclaim salt affected soils. In view of this, attempt haven been made to study the effect of gypsum on the chemistry of saline - sodic soils and thereby improve the current status of such soils. Fifteen soil samples were analysed for their pH, EC, exchangeable cations, organic carbon, available N, P, K and gypsum requirement by standard methods. pH is reflecting alkaline nature of soils. Higher EC have been obtained for downstream area which is associated with shallow water table. Out of four exchangeable cations, the exchangeable Na⁺ was found to be higher in the downstream part. The available N varies from 119 to 147kg/ha, P varies from 2.47 to 11.77 kg/ha whereas K from 75 to 880 kg/ha in the area. The sodic soils have low to very low content of nitrogen and phosphorus and high to very high content of available K. The gypsum requirement (GR) varies from 8.89 to 23.35 t/ha in the area. The GR of the soils in the area is found to be very high. This is possibly due to high order of K and Mg present in the soils. The application FYM, compost and vermi compost including green manures along with gypsum should be encouraged to reclaim saline - sodic soils. Farmer's participation and training has been looked as the best means of solving the problem of saline - sodic soils management in the area.

Sofia Djerdali

Professor, University Ferhat Abbas, Algeria

&

Francisco Sanchez Tortosa

Professor, University of Cordoba, Spain

Anthropogenic Changes in Environment Causes Higher Productivity in the White Stork *Ciconia* *Ciconia* in Sétif Area (Northern Algeria)

Factors affecting population dynamics of the White stork are still under investigation and it seems that it is affected by more than one parameter.

The aim of the present study was to evaluate the effects of extra food from the rubbish dumps and particularly waste from poultry dumps that are expanding in the study area and used by the White stork as a new resource, which could be the cause of increase in the number of this species. The study was carried out in eighty eight different colonies of White stork in northern Algeria (35°49'N, 05°31'E; 900 m.a.s.l.) over a four-year period (2002–2005) that was characterized by considerable variation in precipitation.

Results of the GLM showed that breeding success of White stork is dependent upon distance to rubbish dumps ($F(1, 3011) = 10,79, P = 0,001$). There was a highly significant interaction between the year and the availability of food ($F(3, 3011) = 8,84, P < 0,0001$), That is reproductive success was higher when extra food in all years except in 2002, , which could be due to the very low rainfall during the rearing season (months of April, May and June) in 2002. In the other hand the mean values of reproductive success were higher in colonies near rubbish dumps during the years 2003, 2004 and 2005 suggesting that currently dumps may play an important role in the white stork population dynamic.

Riyad Abdullah Fathi

Professor, University of Mosul, Iraq

Hana S. Al-Salih

University of Mosul, Iraq

Douglas L. Godbold

Universitaet fur Bodenkultur, Austria

&

Tomos, A. Deri

Bangor University, UK

Detection of Uranium Contamination in Acacia Cell Sap by Capillary Zone Electrophoresis (CZE) Technique

The study was carried out to detect uranium level in the cell sap of acacia plant cells, for this purpose callus cultures of *Acacia albida* was used as well as plants. Cell saps from both callus and plant leaf were taken using Micro capillary syringe and detected using Capillary zone electrophoresis technique. It was shown that using citrate buffer of 3.0 pH help in detecting uranium accumulated in the cells. Prospective calculation for the level of uranium uptake showed that 1.64mM is the level of uranium in the leaf cells that had been grown on soil with addition of 500 mg.kg⁻¹ uranyl nitrate for 3 months, while for callus which grown on MS medium with addition of 500 mg/l uranyl nitrate for the same time (3 months) uptake of uranium reached 0.8 mM. The comparison between TXRF analysis of uranium accumulated in plant tissues and CZE efficiency in detecting uranium level in cell sap of both leaves and callus cells, it was shown that both techniques prove that *A.albida* plants can accumulate uranium with a level double as that taken by callus cells.

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&

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Selection the Best Interpolation Method of Gis Technique for Mapping Spatial Distribution of Soil Properties of an Area Located at Northern Iraq

Soil properties were characterized by the spatial variability distributions, the results of both the internal geogenic, external anthropogenic and the pedogenic processes. The impacts of these various processes, on soil chemical and physical contents are different, in space and time, from one variable to another, then producing various spatial distributions accordingly. Thus, one method of spatial interpolation of GIS technique does not respond for all the variables even in the same place. This study is highlighted the point of how to choose the interpolation method for mapping the spatial distribution patterns of the soil properties. The study area was located in Northern part of Iraq, and surface soil samples from 21 locations were taken for interpolation of local maps purposes. Texture (sand, silt and clay), pH, EC, organic matter, Calcium Carbonate, Soluble Potassium and Soluble Sodium values were measured for each sample. The chosen interpolation methods were Kriging, Inverse Distance Weighted (IDW), Radial Basis Functions (RBF), Global Polynomial (GP) and Local Polynomial (LP). The performance of the interpolation methods was done using geostatistics analyses by the Mean Absolute Error (MAE), Mean Bias Error (MBE) and Root Mean Square Error (RMSE). The results showed that the IDW and kriging were the best methods for most of the studied variables, while the RBF, GB and LP were inappropriate.

Andreas Kanarachos

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Building Retrofitting Using Hierarchical Optimization and Principal Component Analysis

In view of the needs for optimization (performance, costs) of building retrofitting, several methods have been proposed in the past. These methods are mostly based on multivariate analysis of data and on mathematical optimization methods. However, the complexity of the task reveals the need for further methodological developments. In this paper a new method based on Hierarchical Optimization (HO) and principal component analysis is proposed. Hierarchical optimization is concerned with decision making problems that involve multiple decision makers ordered within a hierarchical structure and has proved already its usefulness. It helps transforming a global optimization problem into a number of local ones, which also consort with engineering knowledge, manufacturing constraints and practice. In this sense a principal component analysis helps greatly the definition of efficient sub-optimization problems. The above methodology is presented in the following and a case study illustrates its usefulness.

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&

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Influence of Repeated Injection Molding on Some Physical and Mechanical Properties of Wood Polymer Composites

The influences of the re-injection molding (repeated extrusion) number on the some physical and mechanical properties of wood polymer composites were investigated. To meet this objective, pine wood flour was compounded with polypropylene with and without coupling agent in a twin screw corotating extruder and then were manufactured by injection molding process. After some physical and mechanical testing of wood polymer composites, retained tested samples of wood polymer composites was subsequently pelletized. After that these pellets were stored in a sealed container and then dried for about 3–4 h before repeated injection molded. These processes were repeated for 7 times. Each repeated times; wood polymer composite samples were tested accordingly related ISO standards. Aims of this study, wood polymer composites made of PP and pine wood flour with and without MAPP have been studied after various numbers of repeated injection moldings to gain knowledge about the changes of some physical and mechanical properties.

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Capability of *Vicia faba* L. in Evaluating Surface and Waste Waters Toxicity of Shkodra Lake, Albania

The use of bioassays to screen the mutagenic potency of complex environmental mixtures, such as surface or waste waters is getting an important part of monitoring projects. The present study was carried out to evaluate the possible toxicity of surface and waste waters collected from Shkodra Lake (a transboundary lake between Albania and Montenegro) during April and September 2013, by using in vivo *Vicia faba* L. assay. Physicochemical characterization of four different samples and morpho- and cytogenetic analyzes of *V. faba* roots grown in these samples, including: root length, mitotic index and frequencies of chromosomal aberrations and micronuclei, were done. The evaluated biological effects of some water samples appeared related to the physicochemical parameters. The results revealed seasonal fluctuation of samples toxicity, being more hazardous during September (dry season). The most polluted samples were the mouth of Moraça River (industrial effluents from an Aluminum plant) and the main dump of Shkodra city (municipal wastes), causing strong genotoxic and clastogenic effects on broad bean roots. It was noticed that pretreated wastes from Shiroka locality (municipal and touristic wastes) induced low toxic effects. Meanwhile there was observed no significant risk of anthropogenic influence in the open part of the lake (middle lake sample). This study highlighted the capability of *V. faba* assay in toxicity bio-monitoring of fresh and waste waters and the necessity to combine physical-chemical analysis with cytogenetic approaches, for better understanding the impact of mutagens on biota health.

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&
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Integrated and Optimized Energy Management System

Energy management systems are considered as an appropriate instrument to identify and develop energy efficiency potentials. Therefore in the industry a high priority is given to the implementation of energy management systems which increases energy efficiency. Voestalpine Austria Draht GmbH is working on the optimization of energy use for years. In the field of heat recovery, prevention of heat loss, efficient lighting and optimization of the hydraulic systems of the cooling water supply potentials were identified for reduction of energy consumption and implemented in projects step by step.

An important basis for further energy optimization of the production at the sites is the continuous analysis of energy performance indicators on the basis of timely recorded energy consumption data of the production (furnaces, rolling mill, drawing systems, heat-treating equipment, pickling) and the operational infrastructure (compressed air supply, lighting, cooling water supply, exhaust systems) for the assignment of energy consumption for equipment, production and operating conditions.

A specific selection, prioritization, combination and compression of data are very important. A suitable physical plant model was developed. This model is based on input-output models of the process and media supply plants and describes the process structure (process units, plants) with their energy needs, the dependency of the energy demand, the process-related relationships and dependencies of the expected range of variation and the sensitivity of the data. So this model is used to identify the parameters which are relevant for the timely description of the energy consumption of the plants as well as a basis for prediction of the energy and power consumption depending on the production program, the operation mode and the working load. The model also takes in consideration the new rolling mill and the integration into the existing infrastructure. On this basis, significant data points, the architecture of the data acquisition, data storage and data analysis are defined and the communication strategy with the energy provider - voestalpine Stahl Donawitz GmbH & Co KG - harmonized. The goal is the overall process optimization, and thus the reduction of primary energy and CO₂ emissions.

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&

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External Benefits of Waste-to-Energy in Korea: A Choice Experiment Study

The Korean government has planned to expand a variety of waste-to-energy (WtE) facilities in order to reduce waste disposal, decrease the importation of crude oil, and mitigate greenhouse gases (GHGs). One response to this concern is to measure the external benefits of WtE. To this end, this study attempts to apply a choice experiment (CE) to four attributes or types of benefits such as the improvement of energy security, reduction of GHG emissions, job creation, and extension of landfill life expectancy. A survey of 500 households was undertaken in Seoul, Korea. The trade-offs between price and the four attributes for selecting a preferred alternative are considered in the CE survey and a marginal willingness to pay (MWTP) estimate for each attribute is derived. A nested logit (NL) model is employed in this study, rather than a multi-nomial logit (MNL) model since two specification tests indicate that the NL model outperforms the MNL model. The estimation results for the NL model show that the MWTPs for a 1% increase in energy security, a 1% reduction in GHG emissions, the creation of 10,000 new jobs, and the doubling of landfill life expectancy as a result of expanding WtE facilities are estimated to be KRW 437 (USD 0.4), 1,763 (1.6), 598 (0.5), and 89 (1.3) per household per month, respectively. First three results are statistically significant at the 1% level. The findings can provide policymakers with useful information for evaluating and planning WtE policies and projects.

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Toxic Potency Evaluation of Metal-Doped River Water (Cr, Cu and Pb), on *Allium cepa* L. - An Albanian Case

Different natural and anthropogenic sources have progressively increased metals concentration, posing a serious environmental and ecological concern due to bio-accumulation tendency and toxicity. In the present research the *Allium cepa* L. test was used to assess the toxicological tendency of some surface water samples taken in Drini and Buna Rivers (North Albania) and to evaluate the toxic potency of three metals (copper, chromium and lead) experimentally added in analyzed natural waters. The roots of onion bulbs were grown for 48 h in river samples mixed with three doses, representing the corresponding $\frac{1}{4}$ EC₅₀, $\frac{1}{2}$ EC₅₀ and EC₅₀ concentrations of K₂Cr₂O₇, CuSO₄, Pb(NO₃)₂ salts (EC_{50-s} were evaluated in a preliminary root growth inhibition test for 96 h). Endpoints of roots exposed to unloaded and metal-loaded samples, as: morphological aberrations, mitotic index, micronuclei formation and chromosomal aberration frequencies and types were evaluated and compared. *A. cepa* assay exhibited different sensitivities according to water quality of river samples, metals and corresponding concentrations. There was detected a certain difference of cytogenetic endpoints between two groups of natural samples. The results showed strong toxic potency of these metals, especially lead, revealing that metals excess in natural waters as Drini and Buna Rivers could cause remarkable phyto and genotoxic effects on onion roots meristem. The most frequent chromosomal abnormalities resulted: c-mitosis, stickiness, bridges/fragments and micronuclei, demonstrating high genotoxic and clastogenic effects induced. This approach proved to be valuable and appropriate in early warning detection and bio-monitoring the heavy metal pollution in natural water bodies.

Arij Mousa

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The Cognitive Apprehensions Regarding Drinking Water among Educated Americans and Arabs Living in Middletown

This qualitative study described and compared the cognitive apprehensions regarding drinking water quality (DW) in Muncie, Indiana, USA. The comparison was between two different, culturally elite groups using constructive-grounded theory. Eighteen semi-structured interviews were conducted with both Arab (n=9) and American (n=9) participants. Five essential themes emerged from the interview data: the sensory properties of drinking water, pollutants, health concerns, information sources, and experience.

The data from this study is grounded to the epistemologies regarding drinking water. The epistemologies differ between the Arab and American groups due to social factors, such as ethnicity, culture, and past experiences. The study showed that the two groups in the study perceived knowledge regarding drinking water in different ways.

The study showed that the educated Arabs had different cognitive apprehensions regarding drinking water compared to educated Americans due to their previous experiences with drinking water quality in their home countries and their lack of interest in the local media. However, similar findings regarding beliefs about pollutants and diseases in drinking water were shared between the groups. The grounded study found that each group had different behaviors regarding drinking water, and it developed a theory that described how different epistemologies lead to different actions regarding drinking water among different ethnicities.

Some recommendations based on the study findings endorse that the government agencies should provide a readily accessible publication about the drinking water quality to the community. It is recommended that the government agencies promote the dissemination of water quality studies' findings through mass media, social media, and other means of communications with the public. In addition, recommendations should also be provided to enhance the local environmental awareness of international students at universities.

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Waste Composition in the Middle East Technical University - Northern Cyprus Campus

As in most of the countries, environmental problems caused by solid waste are becoming major issue in North Cyprus. In order to create awareness about the problem of solid waste in the area of the campus and the country, the Northern Cyprus Campus of the Middle East Technical University (METU-NCC) interested in implementing a solid waste management program in the campus. To be able to develop a sustainable waste management program, the composition of the waste must be identified first. In order to identify the current situation of the waste composition, the solid waste characterization and quantity must be measured. During 2012-13 academic year, the waste composition analysis was performed in the campus. The solid waste data are obtained by evaluating the certain ratio of the solid waste coming from different areas of the campus such as dormitory buildings, academic buildings, administrative buildings, housings, etc. In order to identify the seasonal differences, the waste composition studies were made during fall, spring, and summer. The result of statistical analysis shows the composition of seasonal solid waste is not statistically significant. The results reveal that the organic waste has the highest solid waste amount in the campus and the waste composition varies from area to area.

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Air Pollution and its Impact in Indian Cities - A Case Study of Hubli Dharwad Cities of Karnataka State: A Geographic Approach

Environmental Pollution is a wide reaching problem. It damages human health and other biotic life. Air pollution is caused when air is contaminated with poisonous gases, minute particles of heavy metals and other droplets of liquids etc. Dispersion of air pollution depends upon various factors which includes weather condition, topography and local situation. This paper attempts to provide the insight view of effects of air pollution in Hubli Dharwad, the second biggest cities in Karnataka state. In these cities the air gets polluted by exhaust fumes of heavy vehicle traffic, pollutants given off by constructional work, industries and mismanagement of garbage dumps. The analysis proves that air pollution is not only seriously affecting the human life but also caused serious damage to animals and plant life. The agricultural practice is also much affected by it around these cities. The researcher analyzed that the present advancement in the field of science and technology is not enough to balance the ongoing pollution effects in these cities. Therefore advance resources of man power are necessary to balance the unequilibrium state of environment for better living of man and other biotic life.

Weather and micro-climate are the major factors affected by air pollution. Thus it is necessary for greater understanding of border-regional climatology. It can sufficiently summarize the important spatial and temporal complexities of air circulation and variations in its compositional change and effects in these regions. It also highlights seasonal and regional variations in controlling climatic factors.

Liza Powers

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Planning for Climate Change in the Port of Houston's Turning Basin Terminal Development

Lack of proper planning for climate change can lead seaports to have compromised infrastructure, increased release of toxins in water, and delayed and costly shipping operations. Climate impact studies forecast change of sea level and intense storms to almost 100 years, offering broad probabilities and causing a time disconnect since most ports plan for 5 to 10 years. Literature on the subject indicates that port decision makers are aware that climate change will occur and affect their seaports in a far distant future; however, they are ill equipped to plan for this change with lack of concrete figures for their specific region.

This case study will review the Port of Houston Authority's current renovation project of the turning basin terminal, roughly eight miles from downtown Houston. Along the Gulf Coast's hurricane alley, Houston's port ranks first in the US in foreign tonnage as well as second in the country for total tonnage. Both prone to hurricanes and a financially significant port for the US, climate change preparation should rank high in the port's immediate and future designs. This research will explore and determine how climate change has already affected the Port of Houston and how potential sea level rise and storm intensity have factored into their ten year plan for the turning basin terminal.

By pulling USGS maps and data from the Army Corps of Engineers and NOAA, this will establish a pattern of climate change that may have historically affected the port. By examining the annual sustainability reports published by the port of Houston this will determine the level of consideration to climate change and policy implementation. Interviews of decision makers of the port of Houston Authority as well as review the published public meeting minutes will show how climate change has factored into the planning of the turning basin terminal. This research will determine how the Port of Houston's Authority factors the need to plan for sea level rise and more intense storms. As a significant port to both the global economy and threat of climate change, maritime port planners can use this discovery to evaluate other ports' risk management to the climate.

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Bio Invasion Thought Ballast Water Discharge - A review of the international Legal Framework

Bioinvasion, or invasion of non-indigenous species into different regions is becoming a major environmental concern globally. Due to rapid globalization, ecosystems that have taken centuries to develop are increasingly facing attack from alien species- and one major cause of such invasions in the marine environment is the discharge of ballast water from ocean going vessels.

The introduction of steel hulled ocean going vessels, led to sea water being pumped into the ballast tanks of vessels to provide stability and increase maneuverability. This ballast water though imperative for the safety of these vessels, pose a serious ecological threat by transporting millions of organisms from one ecosystem and discharging them in the coastal waters of distant lands. Many of these transferred species survived in these foreign waters and reproduced rapidly, knocking the delicate ecosystem of the host country out of balance even destroying the local population. First recognized in 1903 when large quantities of Asian algae were found in the North Sea, this issue gained prominence in the 1980's with Canada and Australia raising this with the International Maritime Organization (IMO). With the rapid growth of trade worsening this problem, the international community recognized the need for a legal and regulatory framework to tackle this menace. The IMO issued some guidelines in 1991 and this issue was recognized as a major concern at the UNCED at Rio in 1992. In 2004, International Convention for the Control and Management of Ballast Water was adopted by the IMO. Some nations like USA and Norway also have national laws to combat this issue

Through this paper, the authors, while highlighting the environmental impact of ballast water discharge, will attempt to review the existing Legal framework to control the problem including the technology available to meet these standards, and in this context the challenge faced by developing countries to effectively harmonize development and the environment.

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Environmental Accounting of the Mango Productive Chain

The study was performed in a local productive chain for commercialization of mango pulp by the economic importance in the development of Santiago de Cuba region. The aim of this study was to compare the Environmental Sustainable Indicator (ESI) of each chain links with the productive chain viewed like a system. The environmental accounting is performed under the emergy methodology developed by H.T Odum H, 1996. It was applied to calculate the mango in natura and mango's pulp Unit Emergy Values (UEV) as well as the Renewability Index -Environmental Load Ratio (ELR), Environmental Investments Ratio (EIR) and Environmental Yield Ratio (EYR). The emergy of information flow, essential to support all logistic in the chain is a novelty of this analysis. Results show lower UEV and higher ESI for mango productive chain than each chain links individually. It was identified that sustainability of the chain depends on the management of two main resources flow primarily in the fruit production, where there is greater possibility of better management aiming a reduction of fertilizer and a better labor that represents 40 % and 30 % respectively of the total items purchased. The processing reached 31% of renewability by reusing waste streams in the process and energy renewable source in the production. The change for a more efficient and less consuming technologies to distribution and marketing facilities locally constructions are strategies to reduce the environmental load. The methodology used allows proposing improvements by applying Cleaner Production techniques and strategic for sustainability planning of the production chain. Authors are grateful to financial support from Post graduating Vice-Rectorry of Paulista University (UNIP) and Foundation under research of Sao Paulo (FAPESP), due to post-PhD fellowship.

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Quantifying the Viability of Green Infrastructure and Sustainability Practices

This talk examines a case study result of last year's ATINER talk that is now implemented across Florida. Impervious surfaces alter hydrology while impacting water resource chemistry. While historical issues of flooding are still a concern, chemistry, loads and aesthetics are recent concerns. Florida is facing numeric nutrient criteria and testing the potential of a "no net load increase" for runoff and pollutants. With such trends, green infrastructure, hydrologic restoration, indirect reuse and source control are part of retrofit design practices. The study simulates whether runoff and pollutant loads from an urban source area can be managed with re-design to provide long-term "no net load increases". An existing imperviously-paved surface parking facility is re-designed with a series of green infrastructure elements. A biofiltration area reactor (BAR) is clay-lined for water table and denitrification management. A linear infiltration reactor (LIR) of cementitious permeable pavement (CPP) provides hydrologic and solute control while pavement cleaning provides source control. Continuous simulations with climate and site data indicate that re-design achieves a net load decrease without loss of functionality at lower costs to conventional construction. Utilizing continuous simulation models for rainfall-runoff and surficial groundwater (SWMM and VS2D), physical and chemical properties of the green infrastructure elements, soil, vegetation and physical-chemical modeling of these elements with field data; the green infrastructure system meets load reduction for phosphorus, nitrogen and particulate matter, PM (as TSS) to achieve requirements where post-development loads cannot exceed pre-development ("pristine") loads. By creating a quantitative and targeted approach to hydrologic and load control the benefits of CPP, bio-filtration, infiltration, natural assimilation, ionic isolation, and denitrification, the project objectives can be achieved. This design utilizes LID and green infrastructure design in a fashion that enables this site, representative of many similar paved urban sites in Florida. In addition to the added benefit of nutrient removal, this design is also cost and energy effective as well as sustainable and maintainable. The design is able to treat phosphorus, nitrogen and PM down to a level below pre-development conditions and maintain a cost that is more economical than the mean Florida BMP. Runoff volume is also reduced to pre-developed conditions. Results also quantitatively demonstrated that sustainability practices such as pavement sweeping

and cleaning is capable of load recovery for nutrients and PM with significant economic benefits compared to conventional BMPs. The State of Florida has promulgated financial incentives to municipalities for the recovery and management of nutrient and PM loads; which has been successfully adopted across the entire state of Florida with a population of 20 million people.

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&

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Total Fuel Cycle Analyses for Emerging Lng/Cng Fuels: A Comparative Energy and Emissions Assessment

The domestic and international shipping sector is actively considering approaches to reduce emissions from vessels. One approach is to replace conventional petroleum based fuels (residual oil and distillates) with natural gas (either compressed [CNG] or liquefied [LNG]). The purpose of this research is to investigate energy use and emissions associated with the use of natural gas fuels (CNG and LNG) and low and high sulfur diesel for shipping vessels. Using best available data, we applied a total fuel cycle analysis methodology to evaluate “well-to-hull” emissions for vessel operations on a range of US and International routes. This included emissions along the entire fuel pathway, including extraction, processing, distribution, and use of particular fuels in vessels. We evaluated a variety of petroleum and natural gas fuel pathways, looking at how emissions changed when various upstream variables were changed, including: conventional or shale gas; importing LNG, processing it an existing liquefaction facility, or building a new liquefaction facility closer to the port; transporting LNG to the port via truck, barge, or, for the case of imported LNG, regasifying it and transporting it via pipeline to be reliquefied; and whether or not the fuel was stored prior to use. This analysis was conducted for four vessel types: (1) small coastwise OGV; (2) large international OGV; (3) inland tug/tow; and (4) European passenger cargo vessel which represent a range of potential LNG service conditions that are common worldwide. This research demonstrates the relative importance of fuel type, vessel route, and auxiliary engine fuel to total emissions.

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&

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The Exploration of Oil and Gas in Amazonas, Brazil, and the Impacts to the Environment and the Lives of Traditional People

This study deals with an approach to the design of Petrobras oil and gas in Amazonas, Brazil, establishing an analytical cut on environmental issues and social issue that affects traditional peoples impacted by Coari/Manaus, located in the heart of the Amazon Brazilian. In 1986 was discovered the first commercial oil field and natural gas in urucú River, a tributary of the Solimoes basin in the Amazon, considered a watershed event in the history of Petrobras and the local development process. Since then, Petrobras built two underground to conduct gas to regional capitals pipelines. This research shows that large impacts hit the Amazon forest to logging of native trees without replacement and management with assault on rivers, lakes, streams and flooded areas. The pipeline that connected the town of urucú where Petrobras is installed to the city of Coari, county seat of oil and gas in the Amazon, dried three streams supplying water to fish and riparian communities. Added to this, the impact of social order that reached the lives of people with traditional land dispossession of local people, sexual exploitation among other social problems. It should be recognized, finally, that the development model implemented in the Brazilian Amazon has no way to thread the ethnic issue. Economic growth under the auspices of big business does not have to induce and basic environmental conservation and human development of traditional indigenous and non-indigenous peoples, from an ethic of social and environmentally sound development.

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Geotechnical, Chemical and Structural Characterization of Waste Clay from Boron Production

Turkey has 72% of the world's boron reserves and takes the first place with a reserve of 1.8 million tons. Each year 600,000 tons of waste clay results from boron production. For that reason, there is a growing interest to develop novel products based on this kind of waste. In this study, geotechnical, chemical and structural characterization of waste clays from boron enterprises was performed to investigate the potential use in landfills. For this purpose, waste clay was obtained from Eskişehir Kırka Boron Works and it was characterized by using geotechnical analyses (water content, specific weight, liquid limit, plastic limit, compaction, unconfined compressive strength tests, sieve analysis, hydrometer test, hydraulic conductivity), chemical and structural analyses (cation exchange capacity (CEC), XRF, ICP-MS, XRD, SEM, FT-IR). According to the results, the waste clay has a water content of 39.2% and a specific weight of 2.77 g/cm³. According to liquid limit (59%) and plastic limit (35.3%) values, plasticity index was calculated as 23.7%. Compaction test showed that the most effective compression ratio was obtained at the optimum water content of 33%. The unconfined compressive strength was 2.16 kg/cm², the swelling potential was 10.5% and the permeability constant was obtained as 2.7×10⁻¹¹ m/s at 33% water content. Soil classification was performed according to the results of sieve analysis, hydrometer test, liquid and plastic limit tests and it was determined as to be high-plasticity clay (CH). Cation exchange capacity of the clay was 55.44 meq/100 g waste clay. BET analysis showed that the specific surface area of the clay is 5.01 m²/g. The results of XRD, XRF, ICP-MS and FT-IR analyses prove that the waste clay is mostly composed of dolomite, magnesium oxide,

tincal and quartz. These characterization data will be form a background for further studies regarding to potential uses of the waste clay in solid waste landfill sites.

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The Damage to the Environment: A Sight from the Law

Environmental damage is an urgent issue. In this paper we will study this problem from the legal point of view.

In order to understand what the damage to the environment is, we must first determine what constitutes the environment; this is very difficult because it is a complex concept with many components. There are extensive and restrictive criteria; we have adopted a broad notion in which the environment is a system that includes, not only natural resources (biotic and abiotic), but also social and cultural elements like, for instance, an archeological pyramid.

Humans are a component of the environment, thus the environmental damage (*lato sensu*) may be classified in environmental damage indirect to humans, that we will call damage to the environment (*strictu sensu*) and which this paper is circumscribed to, and environmental damage direct to humans for example damage to the health of a person.

This distinction must be considered by laws to regulate autonomously the type of damage that we are interested in, given that it has different characteristics and consequences that are not solely of private interest but also global.

If the environment is an elusive concept, with more reason is elusive the concept of damage to the environment (*strictu sensu*) which is *sui generis* because it does not have the same characteristics than the traditional damage.

This theme gives rise to many questions like: Does the damage to the environment arises only with a legal breach? How can the judge quantify the damage? Who is the competent judge if this damage is not static? Does the directly affected have exclusive rights to file suit, or should any person interested be allowed to file suit? Which new forms has the Law to offer in order to face the serious problem concerned with the damage to the environment?

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&

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Controlling Disinfection By-Products (DBPs) Formation of Yellow River Water by Enhanced Coagulation in Summer and Winter

In order to controlling disinfection by-products (DBPs) formation of Yellow River water in summer and winter, enhanced coagulation was used to remove organic matter in water. The concentration and composition of trihalomethanes (THMs) in different coagulated water were tested to investigate the ability of controlling DBPs of polyferric aluminum chloride-Polydimethyldiallylammonium chloride (PFAC-PDMDAAC) and poly-ferric-aluminum-silicate-chloride (PFASiC), which were chosen according the DOC removal efficiency in previous study. The results showed that PFAC-PDMDAAC and PFASiC used as coagulant did restrain DBPs formation for Yellow River water in summer and winter, respectively. The THMs concentrations of PFAC-PDMDAAC (6 mg L⁻¹) and PFASiC (12 mg L⁻¹) at 72 h were reduced by 38% and 40% compared with PFAC (8 mg L⁻¹), respectively. For summer treatment, the ration of Br-THMs of PFAC-PDMDAAC was lower than that of PFAC, while the ration of Br-THMs in water samples coagulated by PFASiC was not lower than that by PFAC. In addition, season could influence the DBPs formation of Yellow River water. Although DOC of Yellow River water in summer was two times higher than that in winter, the THMs concentration of coagulated water in winter was slightly smaller than that in summer. And the ration of Br-THMs in winter was lower than that in summer.

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**Purification Effect on Eutrophic Water with
Combination of Plagiognathops Microlepis Bleeker
and Different Benthos**

Eutrophication becomes serious problem in many lakes, especially shallow water all over the world. Xenocyprinae and zoobenthos were reported effective on the water improvement and alga control in many researches. They played more and more important roles in the ecological treatment and eutrophication control. A comparative study was carried out on the purification effect on eutrophic water with different collocation of Xenocyprinae and zoobenthos, which were *Hyriopsis cumingii* and *Bellamyia aeruginosa*. 8×3 groups of 100-liter plastic barrels were arranged with different combinations at about 27±2°C in indoor. The results showed that the group of Xenocyprinae, *Hyriopsis cumingii* and *Bellamyia aeruginosa* performed better control functions to *Microcystis aeruginosa*, the removal rate of chlorophyll a could reach (75.3±3.7) %. The combination of Xenocyprinae and *Hyriopsis cumingii* worked a little better on the removal of phosphorus and nitrogen than *Bellamyia aeruginosa*, and the rates were (6.8±1.5) % and (1.8±0.3)% respectively. However, the group of Xenocyprinae and *Hyriopsis cumingii* showed better effect on nutrient reduction than that of *Hyriopsis cumingii* and *Bellamyia aeruginosa*. The descending order of ammonia excretory rate per unit mass was: Xenocyprinae>*Bellamyia aeruginosa*>*Hyriopsis cumingii*, and (56.91±6.33) mg·kg⁻¹·h⁻¹ at most. In the meantime, the control group with alga only showed excellent reduction of phosphorus and nitrogen. The conclusion will provide reference for the control of eutrophication and alga bloom.