



Effective environmental management within the context of sustainability and economic development: a special issue from the 13th International Conference on Protection and Restoration of the Environment (PREXIII), July 3–8, 2016, Mykonos island, Greece

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Nowadays, the challenges in environmental management are diverse and demanding and in most cases necessitate interdisciplinary action between researchers, inventors, scientists, policy makers, law enforcers, and general public. Despite local improvements in sanitation and decontamination issues, global pollution is on the rise, while new emerging pollutants with mostly understudied long-term effects may dominate the direction of future research. These effects are in most cases exacerbated by harsher climatic conditions, water scarcity, shifts in natural populations, and undesired changes in ecosystems. Clearly, traditional tools of investigation and exploration are now rendered insufficient in addressing this multifaceted problem; updates on the ways we detect, monitor, confront, mitigate, resolve, or follow up are urgently needed. The scientific community is the one to look upon for solutions and concrete proposals. The present special issue aspires to give just a glimpse of possible solutions on environmental problems to aid their critical evaluation.

This special issue of Environmental Science and Pollution Research presents a collection of 15 papers initially presented at the 13th International Conference on Protection and

Restoration of the Environment (PREXIII). The conference was held on July 3–8, 2016, in Mykonos island, Greece (<http://pre13.civil.auth.gr/>). The conference was organized by the Division of Hydraulics and Environmental Engineering of the Department of Civil Engineering of Aristotle University of Thessaloniki, the Department of Water Resources and Environmental Engineering of the School of Civil Engineering of the National Technical University of Athens, the Stevens Institute of Technology, USA, and the Department of Civil Engineering of the University of Thessaly. The conference was the 13th from the long and successful series of PRE conferences; PRE conferences have been designed to encourage the exchange of ideas and knowledge between diverse groups of the scientific community concerned by current issues in protection and restoration of the environment. Along these lines, PREXIII focused on the need to improve environmental management solutions, to safeguard environmental quality and to adapt to ever-changing climatic, environmental and socioeconomic conditions.

The manuscripts included in this special issue are based on the ones initially presented at the PREXIII conference;

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however, they have been extended (by at least 50%) and they have undergone the rigorous peer-review process of the journal until acceptance. The topics the papers included in the current issue dealt with are briefly being presented below:

Chen et al. examined the realistic antibacterial activity of plasma-activated water, highlighting the possible artifacts in this activity. By generating and applying plasma to water for specified times, the authors investigated in detail the components that may become key factors to bacterial inactivation. This kind of research is paramount in perfecting established ways of water sanitation.

Furthermore, Santonastaso et al. studied approaches to optimize a discontinuous permeable adsorptive barrier in order to protect groundwater quality. Innovative configurations were tried and applied in an aquifer located in Italy and the results were duly evaluated. This kind of research is paramount in improving novel ways of water sanitation.

Removal of organic pollutants from water was the matter of investigation for Iovino et al. An innovative adsorbing material; combination of zeolitic tuffs and humic acids, was tried against a number of benzene derivatives, using a batch scale experimental apparatus. This kind of research is pivotal in the quest for novel and low-cost sorbing materials.

Quantification of the sustainable development of water use was the aim of the study of Symeonidou and Vagiona. Environmental degradation has brought on various pressures on the freshwater supplies and as such, tools such as the water footprint (WF) concept have emerged in the context of green marketing strategies. This kind of research can provide invaluable information on direct and indirect water consumption, to every contributor factor in supply chains.

Regarding waste management issues, Kyriakis et al. analyzed the steps needed for selection and operation of a waste incineration facility using Greek case studies. More analytically, the authors developed a relevant algorithm aimed at maximizing output and tested its predictive ability on different Greek urban agglomerates of various size and characteristics (Athens, Thessaloniki, and the Central Greece cities of Larisa and Volos). This kind of research offers important practical insights in sustainable waste management.

On the same plane, Zorpas et al. dealt with the behavioral and social issues involved in special waste management in an insular community. In brief, consumers' attitude towards disposal of the highly polluting special waste of spent pharmaceuticals was investigated, for a District in Cyprus. Results were highly indicative of the practices prevailing regarding pharmaceutical waste. This kind of research is fundamental on planning and formulating social awareness campaigns for waste management.

Lors et al. evaluated the environmental hazard of polycyclic aromatic hydrocarbons (PAHs) found in soils from a former coke factory, through the Ecoscore system. Ultimate goal of the research was to correctly classify and discriminate soils according to their toxicity potential based on this index. This kind of research is pertinent to state-of-the-art environmental risk assessment and its application on challenging, realistic case-studies.

Brodersen et al. also investigated cumulative impacts of human activities, this time on a marine environment; this of Saronikos Gulf in Greece. The results indicated that the most impacted meadows were *P. oceanica* in the inner part of the Gulf, adjacent to the most urbanized coastal areas. This kind of research significantly contributes towards integrative, ecologically relevant risk assessment.

From marine water to freshwater, in the work of Kastratović et al., Co and Ni were determined in sediment, water, and different organs of macrophytes from six localities around Lake Skadar in Montenegro. The plants were proven to be good bioindicators of surface water conditions. This kind of research successfully explores ways of biomonitoring for ever-changing, vulnerable aquatic reservoirs.

The effects of human activities were also the topic of research of Kim et al. who investigated the factors influencing As stabilization in mine soils. In their study, the authors assessed in great detail As mobility, examining various parameters affecting the stabilization technique. This kind of research greatly contributes towards successful monitoring of remediation of problematic pollution sources such as abandoned mines.

Effective management of highly toxic mine waste (acid mine drainage) was also the research topic of Kollias et al. who studied ways of formation of artificial coatings, so as to inhibit direct contact of tailings with oxidizing agents. This kind of research substantially promotes remediation and supervision of ongoing pollution sources such as metal mines.

From old industries to new ones, Ozkan et al. investigated the environmental impacts of a printed circuit board (PCB) manufacturing plant through streamlined life cycle assessment. As a result, the most effective recommendations on minimizing the environmental impacts of this process were revealed. This kind of research promotes sustainable production of electronics and waste management.

Exploring new technologies, Papadopoulou et al. investigated the catalytic activity of lipase-inorganic hybrid nanoflowers within various environmentally-friendly ionic solvents. In this way, the green technology of biocatalysis was ameliorated for valuable applications of industrial processes, such as synthesis or hydrolysis of esters, using biodegradable, non-toxic and inexpensive third-generation

ionic liquids and deep eutectic solvents. This kind of research is vital for exploring new ways of Green Chemistry applications.

In the quest for bioclimatic design Zengin et al. investigated building characteristics on how they influence heat flow dynamics. It was noted that building orientation, glazing proportion and aspect ratio of building zones affected heat fluxes in various ways, when examined under specific environmental conditions. This kind of research significantly contributes towards designing energy-efficient buildings, leading to urban sustainable growth.

Finally, Evgenakis et al. detected and quantified metals of toxicological concern in food commodities, more specifically milk powder samples. Various pretreatment methods were applied and critically compared so that precise analysis of food would be made possible. This kind of research is important for detection of trace elements in highly complex matrices relevant to public health.



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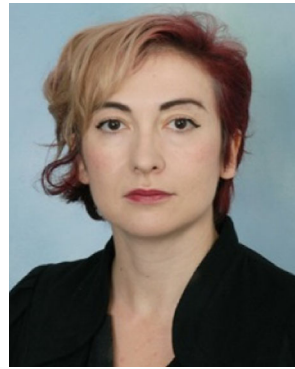
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