

Environmental Pollution and Mitigation

Theme Chairs

Dr. Christos Fountoukis (QEERI), Dr. Tareq Al-Ansari (HBKU-CSE)

The goal of this theme is to gather experts from the region and internationally to present advances in the fields of Air Quality, Climate Change, Water and Soil Quality, Environmental Policy and Chemical and radiological hazards. The theme and its respective sessions will foster an environment conducive to exchanging ideas and information and find solutions to the specific environmental challenges that arid environments currently face. Attendees will have the opportunity to participate in an ideal environment aiming to develop new collaborations and meet experts on the fundamentals, applications, and products of the mentioned fields.

Session 1: Air Quality Challenges in Arid Environments

Session Chairs

Dr. M. Rami Alfarra, Dr. Konstantinos Kakosimos (TAMUQ)

Air quality is a significant challenge for many arid regions, where the combination of high temperatures, low humidity, and sparse vegetation together with natural and anthropogenic pollutants can impact human health and the environment. This session will focus on the latest research and developments in understanding and addressing air pollution in arid regions. We welcome contributions from a wide range of topics including climatology, source apportionment, and air pollution processes in desert environments. Studies on the link between meteorology and air quality and the interactions between natural and anthropogenic pollutants are highly encouraged. The session aims to stimulate discussions on particular aspects of air quality in arid regions such as the interaction of natural dust with emissions from traffic, oil-gas and shipping industries, including their health risks and potential interventions.

Session 2 Climate Change: Adaptation in a 1.5 -2.0 °C World

Session Chairs

Dr. M. Rami Alfarra (QEERI), Dr. Christos Fountoukis (QEERI), Dr. Pranab Jyoti Baruah (GGGI)

The Paris Agreement mandates that global warming should be limited to 1.5-2 °C above pre-industrial levels. Even if these levels are achieved, the IPCC predicts that different parts of the world will face either increased risk of drought or increased flood hazards, in addition to increases in temperature extremes especially over land and other environmental hazards. Humanity must adapt to these changing conditions, with changes in the way we live, the way we manufacture goods, and the way we build cities, all in environmentally sustainable ways that do not increase climate-warming emissions. In this session, we invite presentations on better thermal management of homes and workplaces, resilient

construction, and sustainable natural resource management that are necessary to adapt to the environmental risks posed by a rapidly changing climate.

Session 3: Environmental monitoring and waste management

Session Chairs

[Dr. Khaled Mahmoud \(QEERI\)](#), [Dr. Ahmed Abdel-Wahab \(TAMUQ\)](#)

Monitoring and assessment of the environmental pollutants is a challenging task today, particularly important for the understanding and knowledge of the sources and levels of contamination of the environment with agents that interfere with human health, quality of life or the natural function of ecosystems, as well as unravelling the effects of individual or mixtures of pollutants, their pathways, routes of exposure, and risk factors. The type of pollutants in the environment is exceptionally large and includes chemicals, organisms, and biological materials. This session welcomes submissions that report results from original and novel research addressing problems related to environmental pollution and its impact on ecosystems and human health. Subject areas include waste/solid waste management, analysis of contaminants of emerging concern, its sources, levels, and distribution in the water, soil, and food, and its impact on human bodies. It includes environmental, cultural and social aspects of the waste management system, focusing on waste prevention, reuse, and material recycling, including biological treatment in context of circular economy.

Session 4: Environmental Policy

Session Chairs

[Dr. Sa'ad Abdel-Halim Shannak \(QEERI\)](#), [Dr. Logan Cochrane \(HBKU-CPP\)](#)

Environmental policies are aimed at boosting economic development, reducing and controlling pollution, and helping to meet sustainable development targets. Worldwide and after the launch of Sustainable Development Goals in 2015, several countries became a signatory in meeting climate change objectives and reaching net zero emissions. However, the COVID-19 pandemic has affected government plans and economic resilience. Furthermore, the recent political conflicts push clean energy transition, cause massive forest fires, biodiversity loss, chemicals leaching into rivers and groundwater, and supply shocks across different sectors leading to unpredictability in global water, food and energy supply. In society, these dynamic changes have created psychological, financial, and social insecurity among people. On the other hand, it has offered countries an opportunity to revise their strategic plans and employ more systems approaches. The MENA region is no exception in this equation and has been among the most vulnerable to climate change impacts and in most need of urgent suitable mitigation strategies to avoid, minimize and compensate for associated environmental impacts. This session explores the impact of policy development, technology use, and socio-economic factors on environmental policies to achieve a resilient and sustainable future. Specifically, it offers case studies on the challenges and opportunities facing MENA countries to meet food, water and energy security targets. By focusing on environmental policies and Water-Energy-Food nexus approach, the session's topics will address policy-relevant, topical issues like economics of food security, pathways

for sustainable planning of water-energy-food security nexus, options to balance food security and energy needs, water scarcity and food security, legal frameworks to manage the water-energy-food nexus, and the relationship between environmental policies and economic prosperity in oil-rich countries.

Session 5: Natural and anthropogenic hazards and risks

Session Chairs

Dr. Yehia Manawai (QEERI), Dr. Zlatan I. Tsvetanov (QEERI)

This session explores the observation and assessment of the most eminent natural and environmental hazards associated to fast growing socio-economic development in semi-arid regions. The session is focused on quantifying, forecasting and managing the risks in support of both reduction and mitigation plans. Risks covered by this session include chemical/toxic pollution, radiation contamination and oil spills. The session welcomes abstracts on: Early warning systems for natural and environmental hazards and map vulnerability of elements at risk; Simulation and forecasting of the evolution of environmental disasters: e.g. floods, oil spills and other contaminations; Development of the remote sensing imaging technologies and algorithms to support rapid responses to both natural and environmental disasters.