حكومة رأس الخيمة
Government of Ras Al Khaimah

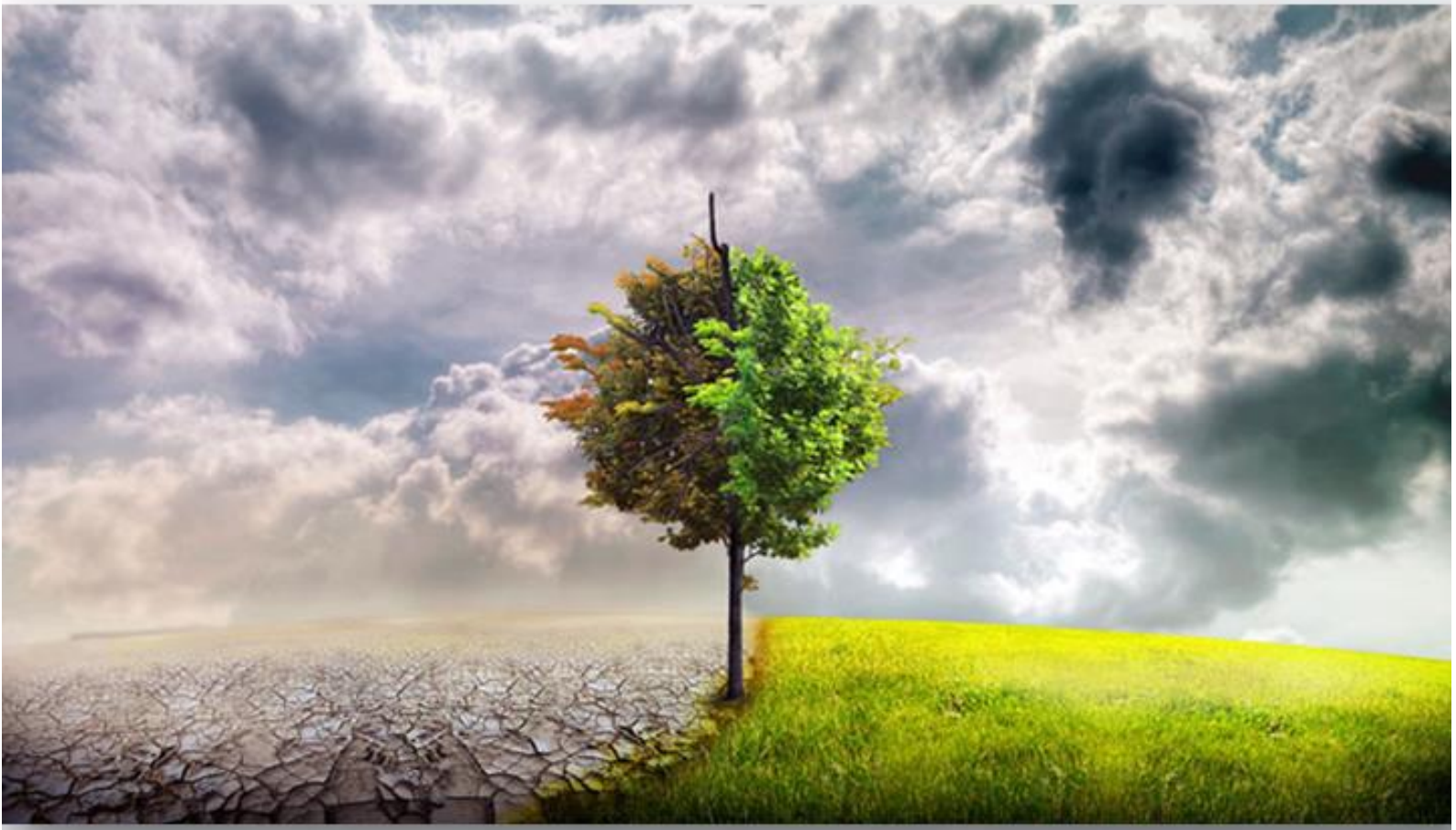
هيئة حماية البيئة والتنمية
Environment Protection & Development Authority

GLOBAL WARMING

5th International Conference
Ras Al Khaimah - UAE
26-28 March 2019

المؤتمر الدولي الخامس حول الاحتباس الحراري: الإلتزام البيئي
5th INTERNATIONAL CONFERENCE ON GLOBAL WARMING :
Environmental Compliance
26-28 MARCH 2019 - RAK - UAE

Environmental Compliance



CONFERENCE PROCEEDING

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Message

We are honored to host **the 5th International Conference on Global Warming: Environmental Compliance,** which will take place from **26-28 March 2019** in Ras Al Khaimah, United Arab Emirates.

Climate change has become a reality, with a clear global consensus, despite the debates and discussions about its potential impacts in all aspects of life and at all levels of political, economic and social sectors. The establishment and development of global and local visions and strategies were aimed at adopting the best practices on how to deal with this phenomenon. Subsequent to the global consensus that the temperature of the universe is constantly increasing, due to various anthropogenic causes, it became a necessity to exercise some control by taking obligatory measures, enforcing appropriate measures and regulations, all to minimize the possible negative impact on the future of humankind, and to contribute actively in achieving sustainable development goals and prosperity for all.

We believe that this conference will be an international platform, addressing the concerns related to climate change and the acceleration of global warming, by gathering scientists and specialists from all over the world to discuss and share their research and expertise. This is with the express hope of formulating policies and concepts that will contribute to protecting our planet and providing a safe environment for future generations.

I welcome you all to this conference, and I hope that we will participate in lighting the way and building a foundation to attain the objectives of this conference for the benefit of humanity and the planet.

H.H. Sheikh Saud Bin Saqr Al Qasimi
Member of Supreme Council of UAE and Ruler of Ras Al Khaimah

Message

It is a great honor to host the 5th International Conference on **Global Warming: Environmental Compliance, under the patronage of His Highness Sheikh Saud Bin Saqr Al Qasimi, Supreme Council Member and Ruler of Ras Al Khaimah,** during 26-28 March 2019 in Ras Al Khaimah, United Arab Emirates.

Climate change and global warming phenomena have become tangible realities. It is necessary to establish rules and adopt strict measures to limit and minimize negative impacts associated with global warming, starting with adherence to ratified international instruments and conventions, down to national strategies and regulations. Here we must join hands to contribute to achieving the internationally agreed goals of the Paris Agreement by working to mitigate the effects of greenhouse gas emissions, adapting and financing the activities necessary to retain the global temperature without rising to more than 2° C, starting from 2020.

In order to achieve this goal, we will face many challenges that we hope to address and solve, and to come up with recommendations that are applicable, not only at the local and national levels, but also globally. We are confident that the sound competencies and scientific expertise gathered here are capable of assisting in doing so.

Once again, it's my pleasure to welcome you all to this conference, trusting that our meeting will be a landmark in the international efforts to combat global warming.

H.H. Sheikh Mohammed Bin Saud Bin Saqr Al Qasimi
Crown Prince of Ras Al Khaimah and Chairman of EPDA-RAK

Message

Organized by the Environment Protection and Development Authority of Ras Al Khaimah under the patronage of His Highness Sheikh Saud bin Saqr Al Qasimi, Supreme Council Member of the UAE and the Ruler of Ras Al Khaimah, the 5th International Conference on Global Warming: Environmental Compliance comes at a time when the world continues to grapple with global warming and the impacts of climate change are amplifying existing environmental, social, and health hazards.

Climate change is a pressing challenge that no doubt defines the face of the 21st century. Leading to more intense and prolonged natural disasters than ever before, climate change is taking its toll on planet earth's people and the environment.

Convening the high-level participation of government and academia to build the momentum for the fight against climate change, this landmark conference underpins the UAE's unwavering commitment to scaling up collective climate action and consolidating synergies between governments and the scientific community.

We are confident that the 5th International Conference on Global Warming will build on the success of previous editions and provide actionable recommendations and takeaways. In doing so, it will ensure a valuable contribution to the UAE's own national efforts to reinforce our ecosystems and support our commitment to achieving the United Nations' sustainable development goals.

In closing, I must emphasize the important role our strategic partner, the Environment Protection and Development Authority of Ras Al Khaimah, plays in catalyzing sustainable development in the UAE to ensure a better future for us all and for the generations to come.

Dr Thani bin Ahmed Al Zeyoudi

UAE Minister of Climate Change and Environment

Message

It is with my pleasure and gratitude that we organize and convene the **5th International Conference on "Global Warming: Environmental Compliance" under the patronage of His Highness Sheikh Saud Bin Saqr Al Qasimi, Supreme Council Member, Ruler of Ras Al Khaimah,** during the period from **26 - 28 March 2019** in the Emirate of Ras Al Khaimah, United Arab Emirates.

The diversity of the environment and the ecosystems of our blue planet are nourishing and life-sustaining, and it's very disappointing to see that this beauty of nature and planetary biodiversity are deteriorating day by day. This has been in large part due to greediness and egoistic pretentiousness of humans in pursuit of prosperity and stability since its inception. The inevitable results of these behaviors are pollution in all forms, the decrease in the ozone layer, and global warming. This has affected earth's ecosystems negatively, resulting in floods, droughts, extreme patterns of climate and hurricanes, and natural disasters have exponentially increased. Therefore, an imperative arises for international conventions, regional and national laws and local regulations, aiming at achieving steadiness and sustainability of natural resources to prevent further depletion.

This conference, which comes this year under the theme of Environmental Compliance, aims to highlight the global, regional and local efforts on the importance of environmental commitment. It is a platform that brings together scientists, specialists and opinion leaders to discuss, exchange and share experiences and knowledge, to achieve sustainability.

Last but not least, I thank all those who redounded to this conference by participation, contribution, efforts and time, especially my colleagues, the staff from the EPDA, for their determination, perseverance and active participation in organizing this conference.

Dr. Saif M. Al Ghais
General Director

المؤتمر الدولي الخامس حول الاحتباس الحراري: الإلتزام البيئي
5th INTERNATIONAL CONFERENCE ON GLOBAL WARMING : Environmental Compliance
26-28 MARCH 2019 - RAK - UAE

5th International Conference
Global Warming: Environmental Compliance
26 - 28 March, 2019

Organized by:	**Environment Protection & Development Authority- Ras Al Khaimah**
Venue:	**Al Hamra Convention Center, Ras Al Khaimah, UAE**

Day 1, Tuesday 26 March, 2019

08:00- 09:50	Registration
10:00 - 10:20	**Session Inaugural**
10:00 - 10:10	**Welcome Address** H.E Dr. Saif M. Al Ghais Director General, Environment Protection & Development Authority, RAK, UAE
10:10 - 10:20	**Inaugural Address and Release of Souvenir** H.E Dr. Thani Al Zeyoudi Minister of Climate Change and Environment, UAE.
10:20 - 11:00	**Panel Discussion :** **Implications & Implementation : Environmental Legislations**
Chairman	**Dr. Matar Hamed Al Neyadi,** Under Secretary, Ministry of Energy and Industry, UAE
Panel Members	**H.E Adel Mohamed Saleh**, Delegate Minister and Director Environment Sector, General Secretariat of Gulf Cooperation Council. **Eng. Aisha Al Abdooli,** Director, Green Development and Environmental Affairs, Ministry of Climate Change & Environment, UAE **Prof. Bradly Smith**, Chair, Fish & Wildlife Commission, Washington, USA **Prof. Joanne DeMark**, Western Washington University, Washington, USA
11:00 - 11:20	**COFFEE BREAK**

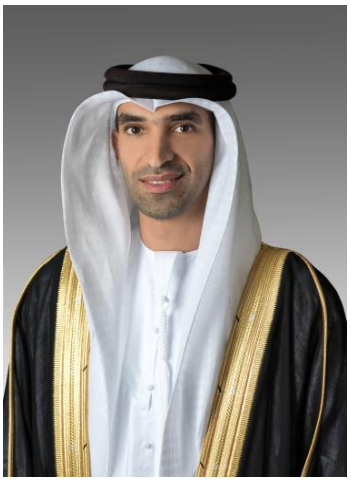
Session I:11:20 - 12:50	**Adjustment of Marine Ecosystem to Climate Change**
Chairman	**Prof. Moustafa M. Fouda,** Minister Adviser on Biodiversity, CBD National Focal Point, Egypt
11:20 - 11:50	***KEYNOTE***
	The Overarching Threat of Climate Change-Southern Resident Orcas
	Prof. Bradly Smith, Chair, Fish & Wildlife Commission, Washington, USA.
11:50 - 12:05	**Coastal Marine Habitat Mapping to Monitor Climate Change Effects in the Northern Emirates of the United Arab Emirates UAE**
	Mr. Daniel Mateos Molina, Marine Conservation - Project Manager, EWS-WWF, Dubai, UAE
12:05 - 12:20	**Causes and Consequences of the 2017 Coral Bleaching Event in the Southern Arabian Gulf**
	Dr. John A. Burt, New York University Abu Dhabi, UAE
12:20 - 12:35	**Integrated Coastal Zone Management plan for El Hammam – Al Alamein area, Mediterranean Coast of Egypt: Climate Change Adaptation Measures**
	Prof. Amr El-Sammak, Faculty of Science, Alexandria University, Egypt
12:35 - 12:50	**Discussion**
12:50 - 14:00	**PRAYER & LUNCH BREAK**
Session II: 14:00 - 16:00	**for Compliance to Governmental Policies and Regulations Case Studies Warming Combating Global**
Chairman	**Prof. Joanne DeMark,** Western Washington University, Washington, USA
14:00-14:30	***Keynote***
	Global warming is a Reality and Every One of Us is Responsible: We Can Reduce it - Seems To Be a Challenge
	Prof. Anwar Huq, University of Maryland, College Park, Maryland, USA
14:30 - 14:45	**Blue Carbon Forests to Mitigate Global Warming: Management Strategies in India**
	Prof. K. Kathiresan, Centre of Advanced Study in Marine Biology, Annamalai University, India
14:45 - 15:00	**Sustainable Consumption and Production of Energy In The Arab Cities with Relation to Global Warming**
	Dr. Ali M. Yaacoub, Director General, Lebanese Cleaner Production Centre, Hadath, Beirut, Lebanon
15:00 - 15:15	**Environmental Initiatives by Star Cement Co. LLC, RAK**
	Mr. Rajeev Bhushan Garg, Senior General Manager Production and Quality Control, Star Cement Co. LLC, RAK, UAE
15:15 - 15:30	**The Environmental Safety Case [ESC]**
	Mr. Jonathan A R Wooldridge, Group HSEQ Manager, Stevin Rock, RAK, UAE
15:30 - 15:45	**An Assessment of Student Perceptions to Adopting Electric Vehicles: A Strategy for Mitigating Global Warming**
	Dr. Robert M. Bridi, Geography and Urban Planing Department, College of Humanities and Social Science, UAE University, UAE
15:45 - 16:00	**Discussion**
	End of 1st Day Program

Day 2, Wednesday 27 March, 2019

08:00 - 09:00	Registration
Session III: 09:00 - 10:35	**Contribution of Recent Technological Advances in Reducing Current Trend of Global Warming**
Chairman	**Prof. Amr El-Sammak,** Alexandria University, Faculty of Science, Alexandria, Egypt
09:00 - 09:30	***KEYNOTE***
	Nano Technology for the Environment
	Prof. Meyya Meyyappan, Chief Scientist, NASA Ames Research Center, USA.
09:30 - 09:45	**Kyoto Protocol, the Paris Agreement…and the US: Governmental and Corporate Regulatory Responses**
	Prof. Craig P. Dunn, Western Washington University, Washington, USA
09:45 - 10:00	**Stopping The Flow of Plastic Into Our Oceans**
	Mr. Tim Niemier, Washington, USA
10:00 - 10:15	**Radon-222 as Tracer of Groundwater Recharge in a Warming Climate**
	Dr. Saber Hussein, Department of Geology, College of Sciences, UAE University, UAE
10:15- 10:30	**Ras Al Khaimah Energy Efficiency and Renewable Energy strategy 2040**
	Mr. Andrea Di Gregorio, Director of Energy Efficiency and Renewables, RAK Municipality, UAE
10:30 - 10:40	**Discussion**
10:40 - 11:00	**COFFEE BREAK**
Session IV: 11:00 - 13:00	**Adaptation & Policies Climate Change**
Chairman	**Prof. Ali El-Keblawy,** Department of Applied Biology, University of Sharjah, UAE
11:00 - 11:15	**Adaptation of Climate Changes in Context of Environmental Sustainability: Policy Appraisal and Response Options in Kuwait**
	Prof. Amr El-Sammak, Faculty of Science, Alexandria University, Egypt
11:15 - 11:30	**Strategies for Leading to Achieve Compliance**
	Prof. Joanne DeMark, Western Washington University, Washington, USA
11:30 - 11:45	**Ecological Impacts of Climate Change in Hot and Dry Regions**
	Dr. David L. Thomson, Department of Biology, College of Sciences, UAE University, UAE
11:45 - 12:00	**Egypt's Perspectives to Mainstreaming of Biodiversity into Climate Change Adaptation and Disaster Risk Reduction**
	Prof. Moustafa M. Fouda, Minister Adviser on Biodiversity, CBD National Focal Point, Egypt
12:00 - 12:15	**Seabirds As Predictors of Climate Change – Global and Local Examples**
	Dr. Sabir Bin Muzaffar, Department of Biology, College of Sciences, UAE University, UAE
12:15 - 12:30	**Natural Resources Management by Fujairah Natural Resources Corporation and its Link to Reducing Global Warming**
	Eng. Mozah Zeyoudi, Fujairah Natural Resources Corporation, Fujairah, UAE
12:30-12:45	**ADNOC Carbon Capture, Usage and Storage (CCUS) Project**
	Eng. Aaesha Al Keebali, Abu Dhabi National Oil Company (ADNOC), Abu Dhabi, UAE
12:45-13:00	**Discussion**
13:00 - 14:30	**PRAYER &LUNCH BREAK**
	End of 2nd Day Program

Day 3, Thursday 28 March, 2019	
08:00 - 09:00	Registration
Session V: 09:00 - 11:35	**Impact of Global Warming on Vulnerable Species in Reducing Ecosystems**
Chairman	**Prof. Craig P. Dunn,** Western Washington University, Bellingham, Washington, USA
09:00 - 09: 30	***KEYNOTE***
	Innovative Solutions to Combine Space Technologies (Geopositioning and Data Collection, Earth Observation, Space Oceanography) for Improved Monitoring of Wildlife by Satellite
	Ms. Aline Duplaa, Wildlife coordinator, Department of Environment & Climate CLS Group, Collecte Localisation Satellites (CLS), France
09:30 - 09:45	**Native Landscape for Sustainability of Arab Gulf Cities in the Hyperarid Climates: Mitigation of the Impacts of Global Warming**
	Prof. Ali El-Keblawy, Department of Applied Biology, University of Sharjah, UAE
09:45 - 10:00	**A Win Win Strategy Between Nature and Humans The Big Picture & A Concrete Proposal**
	Mr. Raul Kalinsky, INDEI, Argentina
10:00 - 10:15	**Global Warming in the UAE: Lesson from the Past, Risks and Challenges**
	Prof. Eric Fouache, Sorbonne University, Abu Dhabi, UAE
10:15 – 10:35	**COFFEE BREAK**
10:35 - 10:50	**Scorched Ecosystems, Scrambling Biodiversity and Species in Jeopardy**
	Dr. Sophy Thomson, Higher colleges of Technology - Sharjah Women's, UAE
10:50 - 11:05	**Emirates Authority For Standardization and Metrology: Efforts Against Climate Change**
	Dr. Yousef Al Saadi, Emirates Authority for Standardization and Metrology, UAE
11:05 - 11:20	**Greenhouse Gas Emissions and Opportunities of Emission Reductions in Abu Dhabi Emirate**
	Eng. Hussein Hamed, Climate Change Scientist, Environment Agency Abu Dhabi, Abu Dhabi, UAE
11:20 - 11:35	**Discussion**
11:35 – 12:30	**CLOSING SESSION**
12:30 - 14:30	**PRAYER & LUNCH BREAK**
	End of 3rd Day Program

About the Minister



His Excellency Dr Thani bin Ahmed Al Zeyoudi was appointed the Minister of Climate Change and Environment for the United Arab Emirates in February 2016. In this role, he oversees the Ministry's mission to spearhead the UAE's drive to mitigate and adapt to the impact of climate change and protect the country's ecosystems through developing and implementing effective measures, policies, and initiatives.

Previously, he served as Permanent Representative of the UAE to the International Renewable Energy Agency (IRENA), the first international organization dedicated to renewable energy and as Director of the Department of Energy and Climate Change at the Ministry of Foreign Affairs.

Earlier, as Project Engineer at Masdar, His Excellency Dr Al Zeyoudi worked to advance renewable energy technologies and solutions. During this time, he also played an instrumental role in the UAE's successful 2009 bid to host IRENA. He started his career as Reservoir Engineer at the Abu Dhabi Marine Operating Company (ADMA-OPCO).

He heads the UAE Council for Climate Change and Environment, the National Committee of Biosecurity, and the Emirates Committee for Sustainable Environment Research. He is also a member of the Board of Trustees of the Khalifa International Award for Date Palm and Agricultural Innovation, the Audit and Selection Committees of the Zayed Sustainability Prize, and the Board of Directors of the Global Green Growth Institute.

His Excellency Dr Thani bin Ahmed Al Zeyoudi holds a PhD in Project and Program Management from SKEMA Business School in France, an MBA from the New York Institute of Technology in the US, an MSc in Project Management from the British University in Dubai and a bachelor's degree in Petroleum Engineering from the University of Tulsa in the US. In 2015, His Excellency Dr Al Zeyoudi received the first Gulf Cooperation Council Excellence Award in recognition of his pioneering efforts in renewable energy.

Keynotes

KEYNOTE

Dr. Bradley Smith

Chairman of Washington State Fish & Wildlife Commission
Washington, USA

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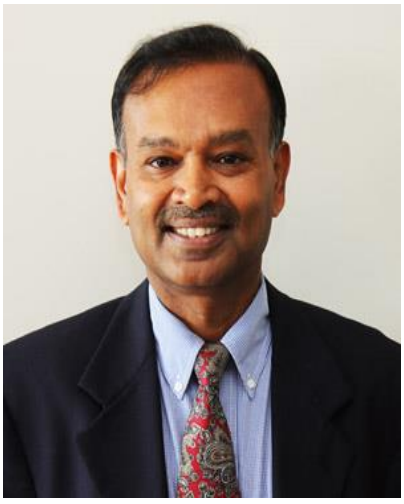
Bradley Smith is the Chairman of the Washington State Fish and Wildlife Commission. He is the Dean emeritus of Huxley College of the Environment at Western Washington University.

Before assuming the dean position Brad served in the Administrators office of the USEPA during the Bush and Clinton administrations serving as the first director of The Office of Environmental Education and as the acting Associate Administrator of the USEPA.

Brad has been a Fulbright Scholar. NATO Fellow and is a Fellow of the Royal Institute of Environmental Science. He currently serves on the North Pacific Research Board. He earned his Ph.D from the University of Michigan.

KEYNOTE



Dr. Meyya Meyyappan
Chief Scientist
NASA Ames Research Center, USA
m.meyyappan@nasa.gov

Meyya Meyyappan is Chief Scientist for Exploration Technology at NASA Ames Research Center in Moffett Field, CA. Until June 2006, he served as the Director of the Center for Nanotechnology. He is a founding member of the Interagency Working Group on Nanotechnology (IWGN) established by the Office of Science and Technology Policy (OSTP). The IWGN is responsible for putting together the National Nanotechnology Initiative.

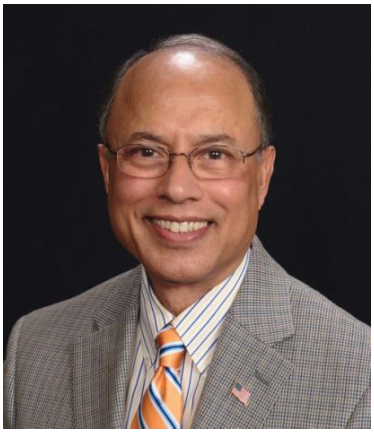
Dr. Meyyappan has authored or co-authored over 340 articles in peer-reviewed journals and made over 250 Invited/Keynote/Plenary Talks in nanotechnology subjects across the world and over 200 seminars at universities. His research interests include carbon nanotubes, graphene, and various inorganic nanowires, their growth and characterization, and application development in chemical and biosensors, instrumentation, electronics and optoelectronics.

Dr. Meyyappan is a Fellow of the Institute of Electrical and Electronics Engineers (IEEE), Electrochemical Society (ECS), American Vacuum Society (AVS), Materials Research Society (MRS), Institute of Physics (IOP), American Institute of Chemical Engineers (AIChE), American Institute of Mechanical Engineers (ASME), National Academy of Inventors, and the California Council of Science and Technology. He is currently the IEEE Electron Devices Society (EDS) Distinguished Lecturer, and was the Distinguished Lecturer on Nanotechnology for both the IEEE Nanotechnology Council and ASME.

For his contributions and leadership in nanotechnology, he has received numerous awards including: a Presidential Meritorious Award; NASA's Outstanding Leadership Medal; Arthur Flemming Award given by the Arthur Flemming Foundation and the George Washington University; IEEE Judith Resnick Award; IEEE-USA Harry Diamond Award; AIChE Nanoscale Science and Engineering Forum Award; Distinguished Engineering Achievement Award by the Engineers' Council; Pioneer Award in Nanotechnology by the IEEE-NTC; Sir Monty Finniston Award by the Institution of Engineering and Technology (UK); Outstanding Engineering Achievement Merit Award by the Engineers' Council; IEEE-USA Professional Achievement Award; AVS Nanotechnology Recognition Award; IEEE Nuclear and Plasma Sciences Society Merit Award. For his sustained contributions to nanotechnology, he was inducted into the Silicon Valley Engineering Council Hall of Fame in 2009. He received an Honorary Doctorate in 2015 from the University of Witwatersrand, Johannesburg, South Africa for His scientific contributions.

For his educational contributions, he has received: Outstanding Recognition Award from the NASA Office of Education; the Engineer of the Year Award (2004) by the San Francisco Section of the American Institute of Aeronautics and Astronautics (AIAA); IEEE-EDS Education Award; IEEE-EAB (Educational Activities Board) Meritorious Achievement Award in Continuing Education.

KEYNOTE



Prof. Anwar Huq, M. S., Ph.D., FAAM
Maryland Pathogen Research Institute and
Maryland Institute for Applied Environmental Health
University of Maryland, College Park, MD 20742, USA

Dr. Anwar Huq received B.S. in Zoology, Masters in Marine Biology from the University of Karachi in 1973 and Ph. D. in Microbiology from the University of Maryland at College Park (UMCP), Maryland in 1984. Dr. Huq began his carrier at the Cholera Research Laboratory in 1974, and subsequently, at the International Center for Diarrheal Disease Research, Bangladesh (ICDDR, B), in Dhaka, Bangladesh as a Research Officer and subsequently as a Scientist and also served as Head of Microbiology Branch, 1984-89. In 1989, Dr. Huq joined the Department of Microbiology, UMCP as Assistant Professor prior moving to the Center of Marine Biotechnology (COMB), University of Maryland Biotechnology Institute (UMBI) at Baltimore, as Associate Professor in 1997. In 2007, Dr. Huq joined the Maryland Pathogen Research Institute (MPRI) where he is currently a Professor and also an Affiliate Professor, Maryland Institute for Applied Environmental Health, School of Public Health, University of Maryland College Park, Maryland. Dr. Huq is a Fellow of the American Academy of Microbiology (FAAM) since 1999, and has served as Director of the University of Maryland-UNESCO Microbiology Resource Center (MIRCEN) 1999-2005.

Dr. Huq's research interest includes understanding of pathogens primarily focusing on waterborne pathogens aiming disease intervention and prevention. Bacterial pathogens occurring naturally in the environment cannot be eradicated. Moreover, with global climate change, significant impact is expected to take place on many of these pathogens. His work on the ecology, survival, transmission and detection of V. cholerae for prediction and prevention of the disease cholera employing conventional microbiological, immunological and molecular methods, and bioinformatics along with oceanography, limnology and satellite remote sensing has been rewarding. Dr. Huq has also worked extensively on safe drinking water. His work on sari filtration for safe drinking water has proven to save lives and sufferings in Bangladesh. Dr. Huq has published over 200 papers in peer-reviewed journals, books and proceedings, and presented over 100 invited talks around the world.

KEYNOTE

Ms. Aline Duplaa
Wildlife coordinator
CLS, France

Aline DUPLAA is the Wildlife and Environment Surveillance Business development within the Environment & Climate Division at CLS.

CLS is a subsidiary of the French Space Agency which core business activity is the commercial operations of satellite systems for data collection and ocean observation of satellite systems for positioning and the development of added-value applications and services based on satellite remote-sensing data.

Following several years as Responsible for International Business Development in the field of consultancy services for environment, forestry and agricultural international projects with an Earth Observation Consultancy Services company, subsidiary of CNES (French Space Agency), Aline has been working as manager of Epidemiological surveillance projects development with satellite solutions. She has been in charge of promoting the use of satellite for health, poverty alleviation and food security programmes.

Today, Aline is responsible for the development of satellite monitoring activity in the animal monitoring application worldwide.

She is also working in International collaborations for biodiversity projects with satellite technology and is managing projects for international donors such as European Space Agency and World Bank.

ABSTRACTS

The Overarching Threat of Climate Change - Southern Resident Orcas

Dr. Bradley Smith

Chair, Washington State Fish & Wildlife Commission, USA.

ABSTRACT

Killer whales (Orca's) are an iconic and treasured species in Washington and throughout the Pacific Northwest. The population of southern resident Orca's, listed as endangered, has declined to the lowest number in three decades. Orca's and their primary prey salmon, are adversely impacted by warming oceans and ocean acidification due to climate change. In 2018 the Governor of Washington State established the Southern Resident Killer Whale Task Force to identify, prioritize and support the implementation of a plan to recover the Orca. Both short and long-term compliance recommendations were put forward in November 2018. Those recommendations will be discussed. As Governor Inslee stated, "extinction is not an option".

Nanotechnology for the Environment

Meyya Meyyappan
NASA Ames Research Center
Moffett Field, CA 94035

ABSTRACT

The global community has been experiencing a great deal of environmental stress manifesting in terms of water pollution and scarcity, poor air quality and many others. Urgent solutions are needed to minimize the impact on human health and preserve resources from the future generations. Nanotechnology offers solutions to some of these problems in environmental monitoring and remediation, water purification, pollutant removal, desalination, green energy techniques and others. This talk will present some examples in the above areas and outline challenges facing the research community.

Global warming is a reality and every one of us is responsible: We can reduce it - seems to be a challenge

Prof. Anwar Huq
University of Maryland, College Park, Maryland, USA

ABSTRACT

The phenomenon of "Global Warming" is encountered by two groups of people, believers and nonbelievers and have their own arguments and evidence to support. However, one aspect of the issue is very clear, that global mean temperature has increased by 0.8°C since the global temperature began to record in 1880 and 0.20°C increase since 1975. Year 2017 ranked as the second warmest since 1880, and 0.90°C warmer than the 1951 to 1980 mean, according to NASA. Why bother about this one-degree warming? We should remember that we are talking about global average i.e., in some place it will be much higher at the same time in other place will be lower. Primary source of heat comes from sun how much it radiates back into space. The amount of energy radiated by the Earth depends primarily on the chemical composition of the atmosphere, specially the amount of heat-trapping greenhouse gases. Carbon dioxide emissions from fossil fuel burning power plants followed by carbon dioxide emissions from burning gasoline from automotive is the major cause for global warming, therefore, we must reduce its emission. Unfortunately, fossil fuel carbon dioxide emissions grew by 1.6% in 2017, after flattening from 2014 to 2016. US emissions increased lately after a decade long decline. CO2 emission increased in India by 6.3% in 2017 and 2018, three times higher than the previous year and during same period, increase in China was over 1.2%. Use of natural gas and oil growing 2% annually. It is deeply troubling that emission is expected to increase in 2019, because of population growth, lower gasoline price and global energy growth, thereby, outpacing decarburization.

We must make ourselves less dependent on fossil fuel, use more renewable energy from wind and solar source. Reduce water waste. EPA estimates, if only 1% American homes retrofit with water-efficient fixtures, about 100 million kilowatt-hours of electricity would be saved per year. Fuel efficient and electric engines, energy efficient appliances and led light bulbs will make an impact. Awareness of the problem must reach to individual citizen and must not to politicized. Based on open and fair assessment, individual government must make policies, implement in an affordable manner, and seek cooperation from the citizens. Global warming is a crisis and must not be ignored. We cannot prevent but we can slow it down.

Key words: Global warming, mitigation, awareness

Innovative solutions to combine space technologies (Geopositioning and Data collection, Earth Observation, Space oceanography) for improved monitoring of wildlife by satellite

Ms. Aline Duplaa
Wildlife coordinator, Department of Environment & Climate CLS Group,
Collecte Localisation Satellites (CLS), France

ABSTRACT

Space technologies have been used for several years to conduct researches and scientists in wildlife monitoring (birds, terrestrial & marine mammals) in addition to conventional monitoring techniques.

These areas of research address principally but not exclusively the scientific domain dedicated biodiversity monitoring. Space oceanographic and radar-based earth observation help environmental monitoring through the provision in near real time of key physical oceanographic parameters, animal's monitoring and detection of oil pollutions.

Wildlife is monitored with ARGOS, a global satellite system which has been used for more than 3 decades to help understanding the displacement, the migration and the movement patterns of animals.

Considering the fact that environmental issues (oil pollutions, land degradation, habitat stress) can have severe consequences on wildlife condition, early information on a threat is highly appreciated by the wildlife community (researchers, scientists, environment decision makers, NGOs, Ministries of environment).

Coastal marine habitat mapping to monitor climate change effects in the Northern Emirates of the United Arab Emirates UAE

Daniel Mateos Molina
Marine Conservation - Project Manager, Emirates Nature-WWF
Dubai, United Arab Emirates

ABSTRACT

Coastal marine habitats provide numerous and diverse ecosystem services as well as contributing to the human well-being and sustainable economic development. These habitats are impacted by a wide variety of human activities and the effect of climate change. The mapping of coastal and marine habitat mapping is crucial to monitor changes in habitat distribution and the sustainable management of marine resources. This study mapped the coastal and marine habitats of the northern emirates in the waters of the Arabian Gulf. An integrative approach was used to overcome remote sensing limitations in the Arabian Gulf due to the turbid waters and habitats seasonality of key habitats. This approach integrated pre-existing information, local ecological knowledge, satellite images and remote sensing analysis, proxy indicators (i.e. turtle tracking) for benthic habitats, and extensive ground-truthing at different stages of the process. The methodology comprises of four major components: (i) image acquisition; (ii) image pre-processing, (iii) image classification, and (iv) post-classification improvement. The total area mapped area was 755.8 sq. km and seventeen habitat classes were identified with moderately high-level of overall accuracy (~70%). This habitat map will provide the northern emirates with a critical tool to monitor and manage climate change effects on coastal habitats.

Keywords: Climate change, habitat mapping, integrative approach,

Causes and consequences of the 2017 coral bleaching event in the southern Arabian Gulf

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ABSTRACT

Coral reefs of the Arabian Gulf were the last to succumb to the global-scale mass coral bleaching event that began in 2015. This study examines the causes and consequences of the 2017 bleaching event on eight reefs located across >350 km of the southern basin of the Gulf. Using a combination of physical modeling and reef-based temperature observations, we show that the summer of 2017 was characterized by unusually low winds which resulted in reduced evaporative heat loss. As a result, temperatures on reefs were among the hottest on record, with daily maximum temperatures averaging 35.9 ± 0.1 °C across sites, with hourly temperatures reaching as high as 37.7 °C. Across the southern Gulf corals spent nearly two months above temperatures that induce coral bleaching and nearly two weeks above known lethal temperatures. This caused 94.3% of corals to bleach, such that two-thirds of corals died between April and September 2017. Mortality continued after peak bleaching, and by April 2018 coral cover averaged just 7.5% across the southern basin, representing an overall loss of nearly three-quarters of coral (73%) in one year. Given the above-global rates of warming occurring in the Gulf, the capacity for recovery and the prognosis for the future of Gulf reefs is in question.,

Integrated Coastal Zone Management plan for El Hammam – Al Alamein area, Mediterranean coast of Egypt: Climate Chang adaptation measures

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ABSTRACT

The Egyptian coastal cities have several different natural potentials which could make them promising economic cities. Human impacts, coupled with global climate change are placing increased pressures on these environments. How these transitional environments can be effectively planned and managed has led to the creation of the integrated coastal zone management (ICZM) approach. Since the mid-1990s several attempts have been made towards ICZM in Egypt, the process is still in its initial stages and needs support and implementation enhance.

This study proposes an appropriate ICZM plan to the decision makers and takers as well as to the stakeholders for "El Hammam – Al Alamein" as a hub of development aiming at achieving its sustainable development (2060). This plan based on the findings of the vulnerability of this zone to climate change impacts carried out by El Masry *et al.* 2019. The following are the main objectives to achieve the study goal:

- Carry out the diagnostic analysis to identify and analyze major key issues in the study area.
- Assess the impacts of climate change and sea-level rise on the study area (physical and socioeconomic) (El Masry *et al*., 2019).
- Propose a management plan for the study area targeting 2060.

Blue Carbon Forests to Mitigate Global Warming: Management Strategies in India

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ABSTRACT

Mangroves are the only blue carbon forest on the Earth. Increasing its forest cover can be a novel counter-measure for global warming as it reduces considerable emission of carbon to atmosphere. The mangrove forests are successfully managed in India by adopting three strategies: (i) promotory; (ii) regulatory and (iii) participatory. In the promotory approach, Management Action Plans (MAPs) are implemented in 38 mangrove areas. In the regulatory approach, mangroves are protected with sufficient legal support in 31 designated Marine Coastal Protected Areas. India is much focusing on participatory management, involving all stakeholders. As a result of these efforts, the mangrove forest cover has increased by 118 sq. km during 2015-2017 at the rate of 1.9 % per year, thereby enhancing the carbon sequestration of the forest. India's target is to create an additional carbon sink of 3 billion tons of CO_2 equivalent through additional cover of all the forests by 2030. In this regard, mangroves are promising. India had a mangrove cover of 6,000 sq. km during year 1960s, and it has reduced now to 4,921 sq. km. However, since 1995, the mangrove cover has got stabilized close to 4,500 sq. km with an increasing trend. However, 40% of the mangrove area is open and sparse. It is proposed to achieve a target of 6,000 sq. km by restoring the mangroves within a period of 10 years thereby increasing the carbon stock. It deserves much attention of policy makers in planning for its utilization in carbon market and trading.

Keywords: Mangroves, carbon sequestration, management strategies in India

Sustainable Consumption and Production of Energy in the Arab Cities with relation to Global Warming

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ABSTRACT

Major drawbacks and side effects of our economic system have become obvious over the last twenty years: depletion of natural resources, increase of prices for mineral resources and energy, unequal distribution of wealth, unequal access to resources, and stress on the natural environment by negative side effects of industrial development like global warming. Therefore, it has become a political imperative to develop a new vision of our economy. A more sustainable economy is the general objective of the European Community as well as of United Nations, and more sustainable policies are under discussion. Industrial production is contributing to the problems: especially by absorbing natural resources and spoiling the natural environment by generating waste and emissions, use of water and generation of waste water from the extraction of resources, the production of industrial goods, the generation of energy.

This paper aims to present that a lot can be done to produce and consume energy in a more efficient way, also how to reach less pollutant at the same time by using materials better and reducing waste by conserving energy and reducing emissions of carbon dioxide and other greenhouse gases by reducing water consumption and by minimizing waste water generation in an economically favorable way. This approach is called "Cleaner Production".

Cleaner Production contributes to economic development in a more sustainable way by conserving valuable resources, water and energy. Our experience from working with more than 1200 enterprises in 30 countries shows that this approach works. This paper explains the principles of the approach, gives examples, what can be done and how the measures pay back, and how the strategy behind can be used as backbone for active management systems oriented towards a more sustainable economy. It is an easy solution for a sustainable consumption and production of energy in the Arab & African Countries.

Environmental Initiatives by Star Cement Co. LLC, RAK

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ABSTRACT

Focus and Commitment towards protecting and development of Environment are essential to achieve the compliances goals for an environmentally sustainable region. Carbon dioxide is the most important and abundant gas among all GHGs which have the highest contribution in global warming phenomenon. Thus, finding promising approaches to mitigate CO2 emissions and usage of different wastes (going into landfill) as Alternate fuel and Alternate Raw material are the priority of all cement manufactures to mitigate the threat of climate change.

There is a more cost effective and sustainable way to reaching global standards on emission through a balance of PLC, PSC and PPC. As Slag and Fly ash are not available in UAE, PLC with increased limestone can help in the reduction of CO2 emission as well as strengthening economy of the country. Star Cement in coordination and support from EPDA, Waste Management Authority, and Ministry of Climate Change & Environment is effectively contributing by co-processing many wastes in safe and Environment friendly manner subject to guidelines of Ministerial Decree 137-2012. Environment Impact Assessment studies are also approved from EPDA for all the Alternate Fuels feeding and Alternate Raw Materials Feeding projects.

Star Cement has completed many projects like closed shed for keeping all main raw materials, raw coal, alternate fuel and clinker, concreting the unpaved areas, Alternate fuels and Alternate raw materials feeding systems, on line stack monitoring system, CCTVs with direct access to EPDA office, etc. in line to comply the regulatory guidelines.

Reduction in Electrical and Thermal energy usage play a significant role in CO2 reduction and environment protection. Star Cement is the only cement industry in UAE which have been awarded the "International Energy Management Excellence Award 2017" through the Ministry of Energy and Industry for receiving ISO 150001 – Energy Management System certification and contribution in energy conservation.

Star Cement commits for a clean and green environment by its all efforts in alignment with EPDA and MOCCAE.

The Environmental Safety Case [ESC]

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ABSTRACT

One of the key problems in the UAE is getting buy in from all types of organization, many of whom do not understand the importance of health, safety and environmental management practice; never mind compliance. The attempt is therefore to look at mechanisms that engage participation, and this is the idea of an Environmental Safety Case. In summary, it is a process that can be easily adopted by all types of organization, although the intention is in driving compliance. This is done by first making sure an organization can identify significant hazards, before they show a process of continual improvement that addresses risks in a timely manner. The process includes mentoring, as many companies don't know how to fix significant problems, and this is what makes this process different. The opportunity is through consultation and participation in delivering a realistic methodology, which is consistent across all business categories. The framework on offer here explores how this can be delivered, through an agency that can set up industry mentoring and handholding taking either a scientific or technological stance. The idea is to build legal compliance *by getting people on board*, whilst offering a realistic legal framework that has guiding principles rather than fines and breaches. This is particularly relevant for developing Countries or regions, with a purpose to determine workable solutions, providing the concepts of sustainable development are made accessible within the knowledge base of those who need it most.

An Assessment of Student Perceptions to Adopting Electric Vehicles: A Strategy for Mitigating Global Warming

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ABSTRACT

The authors investigate the attitudes and perceptions of university students in the United Arab Emirates to adopting electric vehicles (EVs) as part of a strategy for mitigating global warming. The context of the study was the United Arab Emirates University in Al Ain, Abu Dhabi, which currently enrolls approximately 14,000 Emirati and international students. The authors surveyed a diverse sample of 664 students from the seven emirates. Details were elicited about economic, social, and environmental factors that influence the adoption of EVs, perceived advantages of EVs over conventional vehicles, and knowledge about EVs. The SPSS software platform was employed to categorize attitudes and perceptions according to gender, emirate, and age. Participants reported a wide variety of attitudes and perceptions about EVs including environmental benefits and functional drawbacks. Findings show that participant attitudes and perceptions about EVs are influenced by a multiplicity of economic, social, and environmental factors. Neglect of these factors will underestimate the potential to shift preferences toward greater adoption of emerging sustainable transport technologies as part of a strategy for mitigating global warming.

Kyoto Protocol, the Paris Agreement…and the US: Governmental and Corporate Regulatory Responses

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ABSTRACT

It has been argued that the Kyoto Protocol (Protocol), which requires signatories to commit to specific actions within specific timeframes in response to global climate change, has been largely ineffective due to the absence of participation by the two largest economies: the US and China. Some continue to hope the Paris Climate Agreement (Agreement)—from which the US has officially withdrawn—holds promise for arresting or reversing the impacts of global climate change.

Perhaps a more interesting question has to do with the variety of ways in which local governmental regulatory bodies, as well as some major corporations, have maintained or even amplified their commitment to the spirit, principles, and practices outlined in both the Protocol and the Agreement. While the dominant view has been that global problems require global solutions, such may or may not be the case. And whether this is the case or not, when large players such as the US do not commit to such global solutions the matter becomes moot.

It is well worth exploring the positive steps taken by regulatory and corporate bodies that lack national sovereignty—specifically states within the US as well as multi-national corporations—in response to the threat of global climate change. Enlightened action taken by leaders within such movements will be explored as exemplars of commitments to sustainability. It will be suggested that the growing groundswell of non-sovereign action bears the potential to—albeit only to a limited extent—ameliorate the negative externalities associated with a carbon-based economy.

Keywords: Business, Sustainability, Regulation, Climate

Stopping The Flow of Plastic into Our Oceans

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ABSTRACT

Plastic in our oceans is a real problem and is affecting global warming. Why is plastic such a big part of our lives? How does the plastic get there? What problems does it pose? Why isn't this plastic being recycled now? What can we do about it? How could this effort pay for itself?

Why do we need plastic and can we live without it? Are we dependent on plastic and is it possible to not use plastic in the future? If we were responsible about recycling plastic could we continue to use it instead of changing our habits. How does plastic end up in our oceans?

Our oceans are very important for global warming and food security. Plastic in our oceans has many affects that affect global warming that we know about and some we don't understand completely. Plastic in our food supply from our oceans is even more complex.

What are the problems with recycling and why isn't it already happening now? What makes recycling plastic so difficult? Is there a solution for recycling all plastic and what do we have to do make that a reality?

Radon-222 as Tracer of Groundwater Recharge in a Warming Climate

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ABSTRACT

The mountain region of the UAE will be a sensitive area for changes in precipitation with the future climate warming prognose. Finding indicators for groundwater recharge is complicated and requires extensive compilation of specific data sets. We present here a first data set for activity of radon-222 (Rn-222) in groundwater of Ras Al Khaimah area. The data provide new approach for groundwater recharge and quality and will constitute a possibility for tracing changes in groundwater features associated with climate change. For this pilot survey, fifteen groundwater samples were collected from actively used wells in the study area. The groundwater wells occur in clastic sediments and carbonate rocks of varying geological ages. Measurement of radon concentration was performed in situ using portable RAD7 instrument. The results reveal variability between 2 and 31 Bq/L with relatively high activity along Wadi Bih area. Comparison of the results with WHO and EPA permissible limits for drinking water shows that the Rn-222 activity is below the WHO value, but few of the water samples are above the EPA limit. Apparently, old recharge water is indicated by high Rn-222 activity along Wadi Bih where clastic sediments and carbonate rocks represent the aquifer system. This recharge pattern may change with warming climate conditions that can be detected by changes in Rn-222 measurement in the future.

Keywords: climate, warming, groundwater, Radon-222.

Ras Al Khaimah Energy Efficiency and Renewable Energy Strategy 2040

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ABSTRACT

The Ras Al Khaimah Energy Efficiency & Renewable Energy Strategy 2040 was launched in 2018 under the patronage of His Highness Sheikh Saud bin Saqr Al Qasimi, to support competitiveness of the Ras Al Khaimah economy over the long run, by reducing energy and water consumption, and by increasing the use of renewable energy. It targets 30% energy savings, 20% water savings, and 20% contribution from renewable energy by 2040. The strategy is implemented through 9 programs which together address all forms of energy and water consumption. All the programs have already been activated and an institutional mechanism has been put in place to monitor and support the implementation of the strategy. The strategy is expected to result in about 1.7 million tons of annual CO2 emissions abatement from 2040 onwards.

Adaptation of Climate Changes in Context of Environmental Sustainability: Policy Appraisal and Response Options in Kuwait

Prof. Amr El Sammak
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ABSTRACT

Kuwait is facing a wide array of climate change issues including rise in sea level, scarcity of water, desertification and loss of biodiversity. Since 1975, Kuwait has experienced 1.5º C to 2º C increase in temperature, which is significantly higher than the global average.

The present study is aiming at analyzing the current policies, actions, governances and regulations in Kuwait in order to evaluate the current situation and stat any shortcoming in the application of these policies as well as, linking the policies to the climate changes issues and sustainable developments goals. Any policy appraisal should start with screening of the current policies, analysis of the enabling conditions and obstacles, ranking of the policies, and recommend the most successful policies that can be enhanced. To compare the effectiveness of these policies "Percentage Compliance" and "Multi-Criteria Analysis" techniques were applied. Criteria for comparison included those related to SDG and Climate changes.

As a participant in the United Nations Framework Convention on Climate Change, Kuwait is commitment and obligation the application of policies in order to achieve the SDG obligations. To meet this challenge, the Environment Public Authority (EPA), put into operation regulations, policies and governances in order reduce the impact of climate changes and bean active partner in the international community. EPA has the authority to enforce the regulations provided within Kuwait's environmental laws through monitoring and compliance enforcement.

Legal policy such as the new Environmental Law No 42/ 2014 and its modification (Law No.99, 2015), regulatory policy such as Environmental and Social Impact Analysis, those related to reduction of emission such as Environmental Monitoring as well as issuing the environmental and engineering standard, and the permissible levels of all types of pollution (such as air quality, water quality, Noise), Management policy such as Integrated Coastal Zone Management and those related to Environmental Data Management (eMisk). One of the main successful action in Kuwait was the establishment of Environmental Policy.

The Policy appraisal indicated that Kuwait is applying very successful policies and regulations related to the adaption measures for climate changes. Economic instrument, economic Diversification, increasing the percentage of renewable energy and District Cooling technologies are among the successful policies that need to enhanced and replicated.

Strategies for Leading to Achieve Compliance

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ABSTRACT

People and organizations comply for intrinsic or extrinsic reasons. How do you gauge your leadership and regulatory strategies to attend to the range of motivational factors that contribute to compliance? This session examines several key factors in compliance management and leadership. As leaders, we must consider the following: (1) How do we set up regulatory and compliance systems for rewarding those who are intrinsically motivated and for those who are extrinsically motivated, since the world is comprised of both? (2) When and how do we use positive reinforcement for compliance, or negative reinforcement for noncompliance? (3) When and how does punishment support movement from non-compliance to compliance? When not? (4) How do we remove the barriers or punishments that exist that correlate with compliance? (5) What are the ten choices for rewarding compliance and how do we set up flexible reward systems that attune to individual and organizational responsiveness. Using leadership theory and psychology, we will look at the above questions together with clarifying examples for each question; this will assist us in our leadership to achieve even greater environmental compliance.

Ecological Impacts of Climate Change in Hot and Dry Regions

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ABSTRACT

The Arabian Peninsula is one of the hottest and driest regions on Earth - as climate changes, temperatures are rising and much of the peninsula is getting drier. However, less than 1% of global research into climate impacts has been done in hot/tropical regions, and it has been widely assumed that the impacts here will be much smaller than in cooler Northern latitudes where the temperature changes are much larger. Here through a series of field and lab studies, and through synthesis of extensive data, we look at whether small changes in temperature and rainfall in regions which may already be too hot or too dry might have more negative impacts than larger changes in regions which may still be too cold or too wet. We show that species in cooler regions are often living below their thermal optima and may in fact benefit initially from rising temperatures. We find several species from hot regions which have already reached their thermal optima, and these will suffer negative effects of further warming. However, we also found some species from hot regions which are still living below their thermal optima, and others with highly variable optima which may reflect resilience and adaptability. We found that very few species reach their upper thermal limits below 30'C, and very few which can survive temperatures above 50'C – most species reach their upper thermal limits within the band of temperatures commonly seen on the Arabian Peninsula. We compared the impacts of a 3'C temperature increase across a spectrum of hot and cold regions. In cold regions, very few species would be pushed beyond their thermal limits, but the percentage increases in hot regions. Very few of the world's species can survive the temperatures we see in the United Arab Emirates, and the majority of those which can could be pushed beyond their thermal limits by a 3'C temperature rise. We also tested whether desert species are adapted to dry conditions or whether they are living below their optimal levels of rainfall. Without exception, we found that every single desert species studied was living below its rainfall optimum and would therefore suffer if conditions were to become even drier. We compared this with species from other biomes and found the same was true in savannah and tundra species. Indeed, across all the other biomes, we found that species were more commonly living below their rainfall optima than above them, and this even included wetlands and tropical forests, as well as temperate grasslands, temperate forests, and Mediterranean biomes. It would seem that all these biomes are currently too dry, and with deserts being the driest of them all, they may be especially vulnerable if the climate gets even drier.

Egypt's perspectives to mainstreaming of biodiversity into climate change adaptation and disaster risk reduction

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ABSTRACT

The impacts of climate change on society are occurring earlier and more frequently than predicted by IPCC, causing long-term increases in economic losses. Population increases and urbanization are placing additional pressures in sensitive / vulnerable sites (coasts, deltas). Ecosystems and biodiversity provide services for helping people to adapt to the impacts of climate change and disaster risks, by providing multiple benefits,

The Egyptian Initiative (A coherent approach for addressing biodiversity loss, climate change, and land and ecosystem degradation) was launched in November 2018 during CBD COP14 in Sharm El-Sheikh and UNFCC in Poland, December 2018. It addresses RIO Convention, 2030 Sustainable Development Agenda, and PARIS 21. It is knowledge-based, focusing on Nature (ecosystem)-based solutions, adopted during CBD COP14, and promotes actions at all levels as well as voluntary commitments, and synergies among MEA's. It is hoped that the 5 major transformatives changes (don't leave anyone behind, SD as top priorities, economy for job creation, peace and institutional accountability, and seek global partnerships) will be achieved.

Ecosystem-based adaptation (EbA) is the use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people to adapt to the adverse effects of climate change. EbA aims to maintain and increase the resilience and reduce the vulnerability of ecosystems and people in the face of the adverse effects of climate change. Principles and guidelines for Ecosystem – based approaches to climate change adaptation and disaster risk reduction are outlined. Case studies and Lessons learnt are presented.

Seabirds as Predictors of Climate Change – Global and Local Examples

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ABSTRACT

Seabirds are abundant marine species that have major impact on their environment through trophic interactions, movement patterns and breeding activities. Most seabirds congregate in vast breeding colonies in areas of high coastal or marine productivity during the breeding season, feeding on shoals of small to medium forage fish stocks. Breeding activity is closely attuned to increase in phytoplankton blooms, driving the arrival of marine forage fish. Global climate change patterns could alter the timing of arrival of breeding birds, the timing and intensity of phytoplankton blooms and the arrival of migratory food resources such as forage fish. This could lead to a mismatch in the abundance of the breeding seabirds and that of the prey species, leading to changes in the local ecosystem processes through different mechanisms such as shifts in dietary components, reduction in breeding activities and breeding failures. The North Atlantic has experienced rapid warming in recent years due to warming trends and it serves as an important case study for corresponding changes in seabird breeding cycles. Changes in the Arabian Gulf could also have similar effects in local seabird species. Future trends in seabird populations, phytoplankton abundance and bloom and movement and abundance of forage fish in the Arabian Gulf are therefore critical in better understanding how the Arabian Gulf could be responding to climate change.

Natural Resources Management by Fujairah Natural Resources Corporation and its Link to Reducing Global Warming

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ABSTRACT

The vision of the Fujairah Natural Resources Corporation is to exploit and manage natural resources in a sustainable manner while preserving the environment through several ways to reduce the percentage of emissions that lead to global warming:

- Allocate mining areas away from cities to reduce the risk of emissions to the population.
- Preparation of a program (vision) to follow up the exploitation of natural resources and also follow up transport and truck traffic.
- Monitoring of mining installations by drones, cameras, and air monitoring devices connected to the operations and communication room.
- Provide service centers for mining and industrial facilities in the region to supervise the management and organization of work and production control and mining audit.
- To monitor all activities and environmental impact assessment to ensure consumer protection, public safety and the environment in respect of all surveys, mining and mining in accordance with the laws, regulations and technical assets in the country (Ministerial Resolution No. 567 of 2014 concerning the operation of quarries).
- Initiating initiatives to promote environmental awareness in the Emirate of Fujairah.
- Study of future projects for the use of renewable energy and the preparation of research on the reduction of environmental emissions and waste from the activities of transport institution (project filters).

The Fujairah Natural Resources Foundation's efforts to manage natural resources have been explored to reduce global warming.

Keywords: Global warming, Natural resources

ADNOC Carbon Capture, Usage and Storage (CCUS) Project

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Abstract

ADNOC is committed to operate in an environmentally responsible manner and support the UAE's commitment to address the global challenge of climate change. ADNOC's strategy to manage climate change is focused on reducing greenhouse gases (GHG) by increasing our energy efficiency and implementing proven GHG emission-abatement technologies in the short-term, and promoting innovation in our technologies in the long-term.

One of ADNOC's successful case studies in carbon emissions sequestration is Al Reyadah, which is the world's first project to capture carbon dioxide (CO2) emissions from Iron and Steel Industry and reinject it into hydrocarbon reservoirs for the purpose of enhanced oil recovery (EOR) applications. Located in Musaffah, Abu Dhabi, it is the only commercial scale CCUS project in the Middle East region and sequesters up to 0.8 Million tonnes CO2 per annum. The process consists of three elements:

- industrial capture of the gas from the Emirates Steel facilities
- compression and dehydration at Al Reyadah carbon capture facility (CCF)
- transportation of CO2 gas for injection into ADNOC's onshore oil fields for enhanced oil recovery (EOR)

ADNOC has an ambitious 10-year plan to increase its CO2 capture six-fold which will result in safe underground storage and utilization, enhanced EOR and a reduction of GHG emissions.

Keywords: Carbon Capture - Usage and Storage. Enhanced Oil Recovery - Carbon Capture Facility

Native Landscape for Sustainability of Arab Gulf Cities in the Hyperarid Climates: Mitigation of the Impacts of Global Warming

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ABSTRACT

Arab Gulf Countries are characterized by an arid/hyperarid climate with high temperature, little precipitation and high evapotranspiration. The rapid urbanization expansion and the need for green landscapes in these countries put a great stress on the limited water resources, especially under global change scenarios. Native plants could provide a beautiful, hardy, drought resistant and low maintenance landscape that would save the limited fresh water and sustain these cities. The study defined, for the first time, native desert plants that have the potential for greening Arab Gulf Cities. The dormancy, germination rate and level, and germination requirements for seeds of 202 native plants were assessed. Only 110 showed satisfactory germination (a minimum of 15%) without any treatments. Species that had very deep dormancy achieved reasonable germination after been treated with sulfuric acids, different dormancy regulating chemicals, and water soaking. A total of 96 plants species were propagated under shadehouse conditions. The performance of the plants depended on the water treatments. Most plants showed greater growth and reproduction under the wet water treatment (70% of the water added to ornamental plants), compared to dry treatment. However, there was no significant effect for irrigation level on survival of most species. Using native plants in greening Arab Gulf cities would save the limited fresh water resources, reduce the use of harmful pesticides and reduce costs of maintenance.

Key words: Germination, native landscape, plant propagation, seed dormancy

A WIN WIN STRATEGY BETWEEN NATURE AND HUMANS THE BIG PICTURE & A CONCRETE PROPOSAL

Raul Kalinsky
Architect, INDEI
Argentina

ABSTRACT

Global Warming is a material manifestation of a problem that is immaterial, generated from the hidden parts of the CONSCIOUSNESS of humanity, individually and collectively.

It will not be possible to create and operate a policy if it is not from positive action that simply by prohibiting negative actions.

I am here in UAE where the awareness of the lack of water and green is impregnated in the collective consciousness, in the search for the Oasis, that we in other parts of the world do not cease to destroy.

The action that we propose to undertake is made from the expansion of consciousness in our children and young people and on a simple but possible forestation action from the schools.

I will be proposing the joint development between RAK and Argentina of a global school forestry savings plan, which will be composed of very fertile public land with a lot of water in Argentina, and support for the start-up from RAK, and bring together young students from both countries In an enterprise where a small monthly savings of each student, allow them to complete their careers with a self-sufficient scholarship as result of the forest created, and in turn benefit the planet with the growth of that forest where previously there was not.

Planting Love and harvesting solutions

It will be the FOREST OF YOUTH.

Global Warming in the UAE: Lesson from the Past, Risks and Challenges

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ABSTRACT

The Earth's climate is changing. Temperatures are rising, snow and rainfall patterns are shifting, and more extreme climate events – like heavy rainstorms, hurricanes, dust storms and record high temperatures – are already happening. The most vulnerable areas to climate change in the UAE are water, coastal, marine, and dryland ecosystems, buildings and infrastructures, agriculture and food security and public health. The UAE's annual average temperature based on future projections using climate models, suggest an increase of around 1°C by 2020, and 1.5-2°C by 2040. Climate modeling indicates a clear future trend of a warmer climate in the UAE. Preliminary understanding of the changes in the UAE's climate includes: Average annual temperature rise of about 2-3°C by 2060-2079, Humidity increase of about 10% over the entire Arabian Gulf by 2060-2079, increase in annual rainfall between 50-100% in Dubai, Sharjah, and the Northern Emirates and Sea surface temperature increase of 1-2°C by the end of the century.

The effects of climate change are likely to be felt most severely in coastal zones, where marine habitats will suffer from rising water temperatures and salinity, whereas infrastructure will be tested by storm surges and sea level rise. Other risks include weakened food security and health damages from extreme weather events. The UAE has 1,318 Km of coastline. Approximately 85 % of the population and over 90% of the infrastructure of the UAE is located within several meters of sea level in low-lying coastal areas.

Looking the past, a dramatic increase in regional summer rainfall amount has proposed for the southern Arabian Peninsula during the middle Holocene (ca. 9-5 ka BP), based on lacustrine sediments, inferred lake levels, speleothems, and pollen. This rainfall increase is considered primarily by the result of an intensified Indian summer monsoon as part of the insolation-driven, northward shift of the boreal summer position of the Inter-Tropical Convergence Zone (ITCZ) to over the deserts of North Africa, Arabia, and northwest India.

Sorbonne University at Abu Dhabi also prepares to accurately simulate the weather and the climate over the complex area of UAE utilizing its state-of-the-art modeling system SUAFS able to act as a core of advanced early warning and decision support systems.

Scorched Ecosystems, Scrambling Biodiversity and Species in Jeopardy

Dr. Sophy Thomson
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ABSTRACT

The planet is warming triggering changes in the global climate. Analysis of reports indicate that the rise in global temperature is primarily anthropogenic, driven by emission of increased volumes of carbon dioxide and other greenhouse gases. Heat wave, change in the amount and pattern of precipitation have already led to ecosystem disruptions, decline in biodiversity and species loss. Ecosystems do evolve and change on their own but the current global rise in surface temperature has made the change more drastic, and sudden. In several parts of the world it is creating dryer ecosystems leaving them vulnerable. This may result in shifts in vegetation, cause species to migrate or even drive many species such as Polar bears to almost extinction. Evidence is accumulating that plant growth in natural ecosystems has responded to recent trends in warming and to atmospheric changes. The Gulf region which already has extreme heat and water shortages is not immune to the impacts of global warming. According to the fifth IPCC report, global warming is unequivocal. The grave risks it poses to the planet's future requires essential action. Progress has been extremely slow in gaining sufficient understanding of the phenomena and in taking concrete steps to abate and adapt to the changes brought about it. Current global pledges to limit atmospheric warming to such levels are insufficient. A collective will and concerted effort is required to address the challenges posed by the rapid warming. Every individual should bear the responsibility to build resilience, limit emissions, and to mitigate damages.

Keywords: Global warming, Ecosystem disruption, species loss, mitigation

Emirates Authority for Standardization and Metrology: Efforts Against Climate Change

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ABSTRACT

The Emirates Authority for Standardization and Metrology, as the sole standardization body in the UAE, has developed and issued numerous standards, technical regulations, and control schemes in efforts to conserve the environment and reduce emissions. ESMA will demonstrate its regulatory role in ensuring product conformity through recognized marks and approved conformity systems in fuel economy, energy efficiency, water consumption efficiency. The reflection of regulating products on energy consumption rates and CO_2 levels, and their contribution national strategies will be demonstrated. In the theme of mobility and vehicles, ESMA will display events and conferences, and efforts in both light and heavy vehicle emissions and safety. ESMA's pioneering regulations in green mobility, including those regulating Hydrogen cell vehicles, Electrical Vehicles, and Autonomous vehicles will be discussed in-line with Agenda 2021 (Sustainable Environment and Infrastructure) and UAE Artificial Intelligence Strategy 2031.

Keywords: energy efficiency, emissions, transportation,

Greenhouse Gas Emissions and Opportunities of Emission Reductions in Abu Dhabi Emirate

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ABSTRACT

This work presents results of greenhouse gas (GHG) inventory for Abu Dhabi Emirate for year 2016, and GHG projections until year 2030. Using the Intergovernmental Panel on Climate Change (IPCC) Guidelines, GHG emissions in 2016 were calculated as 135,364 Gg CO2-eq. Across the different source activities (energy, industrial processes, agriculture, land-use change and forestry (LUCF) and waste) energy sector was the dominant source contributing to 78.2% of emissions. Removals by forestry and perennial plants were estimated 6% of the Emirate's CO2 emissions. Abu Dhabi wetlands (mangroves and seagrass) hold about 62,000 Gg CO2, which may be released if the wetlands are extracted or drained. During 2010-2016, the Emirate's GHG emissions increased by 36.6%, in consistent with the population increase and GDP growth. While CO2 per capita was among the highest in the region, the carbon intensity for electricity production and the CO2 per GDP were low compared with many countries in the region.

GHG emissions may reach 267,352 Gg CO2-eq in the year 2030 under Business-As-Usual scenario. Abu Dhabi sustainable development strategies have the potential to reduce 42% of emissions in 2030. The major reductions are expected to come from power and transport plans. The mitigation strategies will have public health co-benefits by improving the air quality through reducing the short-lived gases and anthropogenic particulate matters.

The combined GHG inventory and projection supports the federal government in fulfilling UNFCCC commitments, strengthens sectoral capacity for tracking emissions, and provides a solid foundation for drawing up a sound GHG emissions reductions strategy.

Keywords: Abu Dhabi, GHG, inventory, projections.

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