JOINT EVENT

5th International Conference on

Pollution Control and Sustainable Environment

&

10th Edition of International Conference on

Water: Pollution, Treatment & Research

March 14-16, 2019 London, UK

Scientific Tracks & Abstracts

Day 1

SESSIONS

Pollution | Pollution Control Technologies and Devices | Pollution & its Effects on Environment | Energy and Environment | Water Pollution and Treatment

Chair: Olga S Naymushina, The V.S. Sobolev Institute of Geology and Mineralogy of the Russian Academy of Sciences (IGM SB RAS), Russia
Co-Chair: Adel A Ismail, Kuwait Institute for Scientific Research, Kuwait

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Title: The measurement of wildlife exposure to cadmium contributes to assess its contamination in the Hiroshima wide area urban districts and the human health
Yumiko Nitta, Hiroshima Shudo University, Japan

Title: The sanitary impact of air pollution in North Africa
Mourad Terniche, CHU Mustapha, Algeria

Title: Kinetic modelling of scrap tyre pyrolysis through the modified chemical percolation devolatilization (M-CPD)
Vincent Tan, Monash University, Australia

Title: Considering multi-level governance of groundwater – through the case study of nitrate-nitrogen pollution in Shimabara City, Japan
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Title: Hyperloop: The sustainable transportation
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Title: The prospect of water supply in rural areas: A case study of Sabah, Malaysia
Farhana Abd Lahin, Universiti Malaysia Sabah, Malayasia

Title: How night irrigation can contribute to sustainability? – The assessment through the case study in GAP region in Turkey
Hironori Hamasaki, Nagasaki University, Japan

SESSIONS

Air Pollution and Treatment | Pollution and Health Effects | Human Impact on the Environment Waste Management and Treatment | Water and Climate Change

Chair: Adel A Ismail, Kuwait Institute for Scientific Research, Kuwait
Co-Chair: Rosalam Hj. Sarbatly, Universiti Malaysia Sabah, Malaysia

SESSION INTRODUCTION

Title: Hyperloop: The sustainable transportation
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Title: How night irrigation can contribute to sustainability? – The assessment through the case study in GAP region in Turkey
Hironori Hamasaki, Nagasaki University, Japan

Title: Removal of bisphenol A *via* novel 3D g-C_3N_4/HEC hydrogel photocatalysts: Adsorption and phtocatalytic degradation
Xian Ruan, South China University of Technology, China

Title: Solid waste management in the context of sustainable development
Rahma Khalifa Al Riyami, Oman Environmental Services Holding Company (be'ah), Oman

Title: Forest fire prevention through agricultural innovation in the ex-mega rice project area in Central Kalimantan
Susilawati, Central Kalimantan of Asessment Institute for Agricultural Technology, Indonesia

Title: Integrated water innovation
Anna Poberezhna, Smart4tech, UK

Title: Sustainability is cool
Monika Poppy, Sustainability is Cool, UK

Title: Air pollutants and environmental causes in London's air quality
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Title: Air pollution a major factor in asthma predictability index among children living in and around Kolkata metropolis
Jayati Das, Shri Shikshayatan College and Jadavpur University, India

Title: Source apportionment of the redox activity of urban fine particulate matter in Athens, Greece
Constantinos Sioutas, University of Southern California, USA

Title: Separation and retention of some textile dyes in natural water employing polyurethane foams
Ahmed Talaat Tawfik, Dhafarah Region Municipality, UAE

Title: Trends of hydroclimate variables in the upper Huai river basin
Abel Girma, Donghua University, China

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The measurement of wildlife exposure to cadmium contributes to assess its contamination in the Hiroshima wide area urban districts and human health

Yumiko Nitta
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Cadmium (Cd) is one of the contaminants inevitable to be consumed through foods. During a screening of the Cd concentrations in the game meat commercially available in the Hiroshima wide area urban districts, some of the meat contained more than 0.05 mg/kg of cadmium. We set up the two areas having the agricultural landscapes within the districts, captured wildlife and measured the Cd concentrations in muscle and kidney. The distribution of Cd in the body confirmed the higher concentrations in kidney than in muscle. The concentrations in muscle of all the captured wild boars (*Sus scrofa leucomystax*), one of the large wildlife speices were less than 0.05 mg/kg, while the average concentrations in kidney were 1.97±1.67 mg/kg. The concentrations in muscles of the 3 species of the medium-sized wildlife, weasel (*Mustela itatsi*), raccoon dog (*Nyctereutes procyonoides*) and red fox (*Vulpes vulpes*) were less than 0.05 mg/kg, while those in kidney were 4.63±6.66 mg/kg with the range of 0.29-20.60 mg/kg. To find out the source of Cd accumulated into the mammals, the levels in the soil of their habitat were measured. As the Cd values in soil was low at the examined areas, other sources of the Cd accumulated in the wildlife could be suspected. To screen the game meat or the wildlife muscle in the agricultural landscapes by the criterion dose of 0.05 mg/kg was informative for the risk assessment of the humans exposed to Cd.

Biography

Yumiko Nitta pursued her PhD from Hiroshima University and Postdoctoral studies at the Research Institute for Radiation Biology and Medicine from the same university. She is currently a Professor at the Faculty of Health Science of the Hiroshima Shudo University (Japan). She has published more than 25 papers in reputed journals namely: *Cancer Research; Experimental Animals; Experimental Hematology; International Journal of Radiation Biology; International Medical Journal; Japanese Journal of Cancer Research; Journal of Radiaiton Research; Journal of Veterinary Medical Science; Mammalian Genome; Cytogenetics* and Cell Genetics and others respectively.

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The sanitary impact of air pollution in North Africa

Mourad Terniche, Youcef Laid, Samia Taright and **Nouredine Zidouni**
CHU Mustapha, Algeria

The developing countries are facing deterioration of the air quality; many factors are incremented, the most important are the traffic sector and the rapid industrialization. The situation which prevails in emerging countries is not known enough. In Algeria, every year 10 to 12 million inhabitants consult for acute episodes of respiratory diseases. Number of these episodes is directly linked to exposure to air pollution. A period of April 2013 to March 2015, 20,606 patients were received in our consultations. The respiratory symptoms represent 11.23% of the reason for consultation; more part of patients was female with a mean age of 42. The mean reason for consultation was asthma at 28.51%. The upper respiratory tract infection represented 28.38%. COPD (chronic obstructive pulmonary disease) represented 73.4% of inpatients, essentially people with comorbidity. The daily average level of the PM10 (particulate matter) was 53 $\mu g/m^3$. There is a correlation between the daily levels of particles PM10 and the mortality, the hospitalizations and the exacerbation of respiratory symptoms. The impact of the exposure to the PM10 represents 3.4% of all sanitary events. So, a decrease in the PM10 level implies an improvement in public health. Monitoring and management of air pollution is a priority for environmental protection and public health.

Recent Publications

1. C Nejjari et al. (2003) Air pollution a new respiratory risk for southern cities. International Journal of Tuberculosis and Lung Disease 7(3):223-231.
2. Kim J J et al. (2004) Traffic-related air pollution near busy roads: the East Bay children's respiratory health study. American Journal of Respiratory and Critical Care Medicine 170(5):520-526.
3. Li Xiaoling et al. (2008) Acute alcohol intoxication potentiates neutrophil-mediated intestinal tissue damage after burn injury. Shock 29(3):377-383.
4. Yu T S et al. (2001) Adverse effects of low level air pollution on the respiratory health of school children in Hong Kong. Journal of Occupational and Environmental Medicine 43(4):310-316.
5. Y Laïd et al. (2006) Health effects of PM10 air pollution in a low-income country: the case of Algiers. International Journal of Tuberculosis and Lung Disease 10(12):1406-1411.

Biography

Mourad Terniche pursued his PhD from Algiers University and Postdoctoral studies from Algiers University School of Medicine (Algeria). His educational qualification includes Doctor of General Medicine 1996, Diploma of Special Medical Studies (DEMS) in Pneumo-Phthisiology 2001. He is an Assistant Professor in Pneumo-Phthisiology. He has been a speaker at several national and international conferences.

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Kinetic modelling of scrap tyre pyrolysis through the modified chemical percolation devolatilization (M-CPD)

Vincent Tan
Monash University, Australia

The disposal of waste tyres has been an inevitable problem around the world. Approximately 800 million used tyres are dumped annually, with a projected growth rate of 2%. Pyrolysis is as an attractive thermochemical technique for recycling the abundance of waste tyres while at the same time allowing energy fuel production. However, significant problems such as uncertain product yields and product properties could appear, which refrain the pyrolysis oil from being used successfully on a commercial scale. Although plenty of studies have been performed for the pyrolysis of waste tyres in the lab scale, there is very limited knowledge on the industrial heating provisions that use direct and indirect heating to perform the process through the combustion of methane-rich pyrolysis gas for energy-saving purposes. Hence, this study aims to develop a robust kinetic model to predict the pyrolysis of waste tyres, and make the results of experimental studies more applicable as far as practical industrial provisions are concerned. As a result, a chemical-based model (M-CPD) that incorporates a 1-D heat transfer mechanism has been developed to predict the product yields of tyre pyrolysis upon different temperature, heating rate, particle size and even reactor dimensions. The experimental results are obtained from tyre pyrolysis in lab conditions, where industry standards and practices are taken into consideration and simulated, have shown that the tyre oil produced from the direct heating provisions have the strongest potential to be used as petroleum derived fuel substitutes.

Biography

Vincent Tan obtained first-class Honours Bachelor's degree in Chemical Engineering from Curtin University (Australia). He is currently pursuing PhD in Chemical Engineering from Monash University (Australia). He has published one journal paper entitled: Scrap tyre pyrolysis: modified chemical percolation devolatilization (M-CPD) to describe the influence of pyrolysis conditions on product yields in *Waste Management* (2018).

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Considering multi-level governance of groundwater – through the case study of nitrate-nitrogen pollution in Shimabara City, Japan

Hironori Hamasaki and **T Watanabe**
Nagasaki University, Japan

Shimabara City is located in the southeast part of Nagasaki Prefecture, which is in the Kyushu Island, western Japan. It is famous for clean, fine spring water and the local people there have the custom to use it for their daily life traditionally. Its groundwater comes from the mountains in the west side of the city, but recent years, it started being contaminated by nitrate-nitrogen because of the development of agriculture and livestock industries.

Nagasaki Prefectural Government took the initiative to tackle this issue and continued monitoring water quality at 17 points and 72 wells. They also established the consortium whose members are from the government sector, industrial sector, and university, and organized the plan to mitigate nitrate-nitrogen pollution. They have a regular meeting once a year, exchange the information of their activities, and discuss their future plan. However, the pollution level of nitrate-nitrogen in Shimabara has not been improved yet so far.

This study aims at clarifying what is the reason nitrate-nitrogen pollution has never been remedied despite some efforts by the Prefecture. As a methodology, the authors conducted semi-structured interview with some key informants, such as the official of Nagasaki Prefectural Government, Shimabara Municipal Government, and some staff of related industrial sectors. Through these interview survey, we tried to understand the state of the multi-level governance, in other words, the relationship of various stakeholders about this issue.

As a result of our interviews, we found Shimabara City Government has some difficulties in not having effective solutions. For example, they don't have any communication with other related sections in the government and also dialogue with industrial sectors or ordinary people about this issue, because they are not so serious and enthusiastic as the Prefecture.

Recent Publications

1. Hamasaki, H. (2016) "Seeking for the new irrigation governance by co-creation between stakeholders and scientists – through trials of stakeholder meetings and night irrigation in the GAP Region in Southeast Turkey" in Dividing Water - Co-creating local futurability, edited by Kubota, J., Bensei Publishing, pp. 205 – 224.
2. Nakagami, K. and H. Hamasaki (2014) "Mekong River Basin Development and Environmental Conservation in Vietnam" in Overcoming ASEAN Divide and Mekong River Regional Development edited by Nishiguchi, K., et al., Koyo-shobo, pp.196 – 214.
3. Hamasaki, H. (2015) "Climate change impacts on water resources and adaptation - from a perspective of Mekong Delta Region" Journal of Water and Environmental Issues, 28 (1): 67-73.
4. Hamasaki, H. and K. Nakagami (2012) "A New Paradigm of Water Management – Water Security, Governance and Integrated Management" Journal of Environmental Conservation Engineering, Society of Environmental Conservation Engineering, 41(10): 600 – 605.
5. Hamasaki, H. (2011) "A Study on Integrated Water Resources Management in the Mekong River Basin – A Case Study on Ratanakiri Province, Cambodia" Journal of Policy Informatics, Association for Policy Informatics, Vol.5, No.1, pp.19 – 36.

Biography

Hironori Hamasaki has completed his PhD (policy science) at the age of 32 from Ritsumeikan University. He is an associate professor of the Faculty of Environmental Science, Nagasaki University since 2014, with his research experience in the fields of water resources management & governance, water policy & institution for stakeholder coordination, integrated management of water quality and quantity. Recent years, focusing on the case studies on irrigation governance in Cambodia and Turkey, he conducts his research through transdisciplinary approach, that is, holding workshops, group interviews, and action research with stakeholders in order to find the solution for water problems, for example, how much fertilizer and pesticide is appropriate for enough yield, good water quality, and ecological environment.

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Performance evaluation of mechanical booster pump-assisted adsorption chiller cycle

Tao Zeng[1], Jun Li[1], Noriyuki K[1] and **Hongyu H[2]**

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[2]Chinese Academy of Sciences, China

Large amounts of waste heat below 100°C from the industrial sector are released into the atmosphere. The development of new technologies aiming to reduce problems related to energy consumption has become urgent. Adsorption chiller, as one of the heat energy conversion apparatus, can use low-temperature heat source of 60°C-100°C to generate the desired cooling effect for reducing air-conditioning loads. However, the adsorption chiller cycle still has a few problems in practical use; by reason of the cooling power per unit volume of the adsorber and the COP are smaller than that of absorption chiller or vapor compression chiller. To solve the problems associated with the adsorption chiller cycle, we proposed a hybrid adsorption chiller which contained a mechanical booster pump (MBP) in the adsorption process or desorption process. The objective of this study is to investigate the possibility to apply an MBP–assisted adsorption chiller cycle to improve and generate cooling power at a wider operational temperature range, such as operation at a waste heat temperature below 60°C or a lower evaporating temperature. The MBP was set either between the evaporator and the adsorber to increase the vapor pressure in the adsorber or between the adsorber and the condenser to decrease the vapor pressure in the adsorber. The results indicate that the increase of adsorber vapor pressure in the adsorption process contributed to a higher equilibrium adsorbed amount, and the decrease of adsorber vapor pressure in the desorption process resulted in a lower equilibrium adsorbed amount. The cooling heat output and the amount of cooling heat were improved and increased with the input electrical power of MBP.

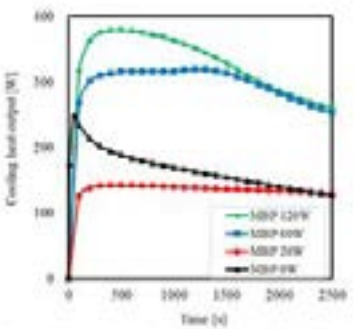

Figure 1. Time variation of cooling heat output for different MBP powers at 15 °C.

Recent Publications

1. Huang H et al. (2015) Performance analysis of a MCFC/MGT hybrid power system bi-fueled by city gas and biogas. Energies 8(6):5661-5677.
2. Li J et al. (2016) Modeling of ammonia combustion characteristics at preheating combustion: NO formation analysis. International Journal of Global Warming 10(1-3):230-241.

3. Zeng T et al. (2017) Evaluation of performance of thermal and electrical hybrid adsorption chiller cycles with mechanical booster pumps. Journal of Materials Science and Chemical Engineering 5:22-32.
4. Zeng T et al. (2017) Performance of an activated carbon-ammonia adsorption refrigeration system. Natural Resources 8:611-631.

Biography

Tao Zeng obtained his Master's Degree in Chemical Engineering, Nagoya University (Japan). He is currently pursuing PhD in Chemical Engineering at the same school. His research interests are mainly focused on the development of adsorption refrigeration systems. He has been a member of the Japan Society of Energy and Resources for the past two years.

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Hyperloop: The sustainable transportation

Samroot Samreen Wani
TERI SAS, India

Due to rapid urbanization and emergence of mega-cities, urban transportation infrastructures are stressed leading to traffic congestion, high fuel consumption as well as increasing number of accidents and fatalities. Present transport sector globally is largely two-dimensional and may not be able to cope up with the growth of cities which is three-dimensional in nature, the environmental pollution, the traffic congestion, the sustainability, etc. This has led to efforts towards three dimensional transportation systems such as passenger drones, flying cars, cars moving through multi-layer underground tunnels etc. The overall concept of three-dimensional transportation demonstrates that the transportation sector has made a significant progress towards comprehending the necessity of a proper and sustainable transit system, which otherwise has implications on environment, health, infrastructure and sustainability as well. However, some of these futuristic options may be associated with safety and security concerns – both for them, as well as caused by them. Some of these options envisage utilization of artificial intelligence and even augmented reality. Technological challenges, the potential for cost-effectiveness, and their socio-economic impacts are also important considerations. Through deep and critical study, in this journal, the author will try to analyze the concept of hyperloop and its practicality; about its various components, its working, global acceptance of hyperloop and its possible advantages and unaddressed issues. Some critics are of the opinion that hyperloop is more of a hypothetical idea which is totally impractical and impossible, but optimistic experts say that it just needs some hard work, a decade's time and huge amount of money which would then result in revolution of the whole transportation system in a unique, unpredictable and sustainable way. A cross-impact analysis to evaluate possible future scenario for this will also be taken up.

Biography

Samroot Samreen Wani completed her graduation in Civil Engineering (2013-2017) and is currently pursuing Masters of Technology in Renewable Energy Engineering and Management for the academic year 2017-2019 from TERI School of Advanced Studies, New Delhi, India. She has been awarded RULA International Award (2018) for Best Researcher for Three Dimensional Transportation. She has to her credit three research papers published. She worked as an Intern with the Department of Science and Technology of the Government of India.

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The prospect of water supply in rural areas: A case study of Sabah, Malaysia

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University Malaysia Sabah, Malaysia

Recent climate anomalies have brought Malaysia's water shortage to a new level. Particularly in the rural regions of Sabah, natives struggle to get access to clean water supply. This paper reviews the issues regarding water service, water source availability and water distribution strategies in Sabah. The main issue in water services in Sabah is the challenging terrain and geographic distance between populated areas in Sabah. This is further aggravated by aged pipelines that contribute to leaks and furthermore non-revenue water (NRW). Literature reviews reveal that apart from surface water as a water resource, Sabah receives abundant precipitation of 1,500 to 3,000 mm throughout the year which could be harvested for domestic uses. Several potential groundwater aquifers are found in the eastern and western part of Sabah with underlying sandstone and Quaternary Alluvium which provide significant groundwater reservoirs. In the coastal and islands areas, quaternary and recent alluvium aquifer gives sufficient water supplies. Due to minimal pollution in rural areas, the water quality is deemed acceptable under the National Water Standard of Malaysia with the exception of some contaminants coming from septic tanks and agricultural activities. A decentralized system that utilizes smaller range of piping networks is more advantageous for rural areas. Smaller size plants that collect and treat water at the point of need will remove the need for longer pipelines and lower cost of installation and maintenance. The review concluded that rural Sabah should utilize the surface water, rainwater, and groundwater based on availability and quality in the individual areas. A decentralized treatment system should be applied to serve small number of houses to ensure good water quality before consumption. However, the treatment unit may be limited to a simpler form of technology as semi-skilled or un-skilled personnel will be required to operate and maintain the system.

Recent Publications

1. Lahin FA, Sarbatly R, Suali E (2016) Polishing of POME by *Chlorella sp*. in suspended an immobilized system. IOP Conference Series: Earth and Environmental Science 36(1), 012030
2. Janaun J, Sinin E, Hiew SF, Kong AMT., Lahin FA (2016) Synthesis, Characterization, and Catalytic Activity of Sulfonated Carbon-Based Catalysts Derived from Rubber Tree Leaves and Pulp and Paper Mill Waste. IOP Conference Series: Earth and Environmental Science 36 (1), 012019
3. Suali E, Sarbatly R, Shaleh SRM, Lahin FA, Anisuzzaman SM (2016) Correlation study of microalgae carbonation in membrane integrated photobioreactor. Source of the Document IOP Conference Series: Earth and Environmental Science 36 (1), 012043
4. Amirhossein Malakahmad, Farhana Abd Lahin, Witton Yee (2014) Biodegradation of High-Strength Palm Oil Mill Effluent (POME) through Anaerobes Partitioning in an Integrated Baffled Reactor Inoculated with Anaerobic Pond Sludge. Water Air Soil Pollution (2014) 225:1883
5. Rosalam Sarbatly, Emma Suali, Farhana Abd Lahin, Chiam CK (2015) Membrane Processes for Microalgae in Carbonation and Wastewater Treatment. In Advances in Bioprocess Technology. Pp 371-386. Springer US, 2015 (Chapter in a book)

Biography

Farhana Abd Lahin has graduated her Civil Engineering Bachelor degree with honor in 2010 and Master's degree in 2014 both of which majoring in environmental

engineering. She has worked as an environmental consultant and has been involved in evaluating the environmental impact of palm oil plantations, sewage and water treatment plants and other urbanization projects in Sabah, Malaysia. She has joined the Engineering Faculty of Universiti Malaysia Sabah as a young lecturer since 2015. Her research works majorly revolves around water and wastewater treatment of which she is currently pursuing her PhD in. Her publication includes research papers in several reputed journals and book chapters.

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How night irrigation can contribute to sustainability? – The assessment through the case study in GAP Region in Turkey

Hironori Hamasaki[1], M.A. Çullu[2], E. Akça[3] and **M.H. Aydogdu[2]**

[1]Nagasaki University, Japan

[2]Harran University, Turkey

[3]Adiyaman University, Turkey

Southeast Anatolia Project (GAP in Turkish Acronym) Region in Turkey is an arid area, where they have only 500 mm annual precipitation. Traditionally, they used to do rain-fed cultivation, but after the irrigation scheme was installed in the Harran Plain, along with the construction of the Ataturk Dam on the Euphrates in 1992, the farmers in the upstream of the water channel got able to use as much water as they wish. However, the farmers in the downstream use less water and sometimes they face water shortage. Thus, some conflicts between the farmers in upstream and downstream occurred. In addition, because farmers there used a lot of chemical fertilizer, severe salinization also took place in their fields.

In order to improve their environmental situation, the authors conducted the project named "night irrigation", that is, we just encouraged farmers to irrigate their agricultural lands at night, aiming at reducing evapotranspiration in the hot weather during daytime and also decreasing the amount of chemical fertilizer. This study assesses not only environmental effect but also economic and social effect from night irrigation by taking advantage of sustainability assessment.

As a result of night irrigation, farmers succeeded in saving 1,000,000 litter of water (in estimation) and some amount of chemical fertilizer, and also in mitigating salinization. In addition, their agricultural crop yield increased about 15%. Furthermore, we noticed farmers' satisfaction with night irrigation was high because they could find some free time to do something they like and also didn't need to work under the hot weather during daytime.

Finally, as a result of our sustainability assessment, we conclude night irrigation can highly contribute to sustainability in this region because environmental, economic, and social effects were all positive.

Recent Publications

1. Hamasaki, H. (2016) "Seeking for the new irrigation governance by co-creation between stakeholders and scientists – through trials of stakeholder meetings and night irrigation in the GAP Region in Southeast Turkey" in Dividing Water - Co-creating local futurability, edited by Kubota, J., Bensei Publishing, pp. 205 – 224.
2. Nakagami, K. and H. Hamasaki (2014) "Mekong River Basin Development and Environmental Conservation in Vietnam" in Overcoming ASEAN Divide and Mekong River Regional Development edited by Nishiguchi, K., et al., Koyo-shobo, pp.196 – 214.
3. Hamasaki, H. (2015) "Climate change impacts on water resources and adaptation - from a perspective of Mekong Delta Region" Journal of Water and Environmental Issues, 28(1): 67-73.
4. Hamasaki, H. and K. Nakagami (2012) "A New Paradigm of Water Management – Water Security, Governance and Integrated Management" Journal of Environmental Conservation Engineering, Society of Environmental Conservation Engineering, 41(10): 600 – 605.

5. Hamasaki, H. (2011) "A Study on Integrated Water Resources Management in the Mekong River Basin – A Case Study on Ratanakiri Province, Cambodia" Journal of Policy Informatics, Association for Policy Informatics, Vol.5, No.1, pp.19 – 36.

Biography

Hironori Hamasaki has completed his PhD (policy science) at the age of 32 from Ritsumeikan University. He is an associate professor of the Faculty of Environmental Science, Nagasaki University since 2014, with his research experience in the fields of water resources management & governance, water policy & institution for stakeholder coordination, integrated management of water quality and quantity. Recent years, focusing on the case studies on irrigation governance in Cambodia and Turkey, he conducts his research through transdisciplinary approach, that is, holding workshops, group interviews, and action research with stakeholders in order to find the solution for water problems, for example, how much fertilizer and pesticide is appropriate for enough yield, good water quality, and ecological environment.

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Removal of bisphenol A *via* novel 3D g-C_3N_4/HEC hydrogel photocatalysts: Adsorption and photocatalytic degradation

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South China University of Technology, China

A series of novel g-C_3N_4/HEC hydrogel photocatalysts with three-dimension (3D) network structure have been synthesized *via* a simple one-pot reaction, using hydroxyethyl cellulose (HEC) and graphic carbon nitride (g-C_3N_4) nanoparticles as raw materials. The characteristics of g-C_3N_4/HEC hydrogels are investigated by X-ray diffraction (XRD), scanning electron microscopy (SEM) and energy dispersive spectrometer (EDS). The optical performances of g-C_3N_4/HEC hydrogels are investigated by UV-vis diffuse reflection spectrum (DRS) and photoluminescence (PL). Scanning electron microscopic results reveal that the hydrogels are polyporous and g-C_3N_4 nanoparticles are uniformly distributed into HEC hydrogel network. Photoluminescence results show that HEC hydrogel network is conducive to seperation of photogenerated electron-hole pairs. The hydrogels show high efficient removal ability of bisphenol A (BPA) by adsorption and photocatalytic degradation. Among the different g-C_3N_4 compositions, addition of 50% g-C_3N_4 showed optimized adsorption and photocatalytic degradation of BPA, which are 9.88 mg•g^{-1} and 80% within 120 min. Moreover, the g-C_3N_4/HEC hydrogels showed higher efficient removal performance of TOC. Due to synergistic effect of adsorption and photocatalytic degradation, g-C_3N_4/HEC hydrogels are able to mineralize BPA continuously and efficiently. In addition, the g-C_3N_4/HEC hydrogels can be reduplicated used without complex desorption processes.

Biography

Xian Ruan has completed her bachelor's degree in chemistry from South China University of Technology and carry out a successive academic project that involves postgraduateand doctoral study in enviromental engineering at the same university.

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Solid waste management in the context of sustainable development

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The waste management hierarchy, which emphasizes on minimal waste production with disposal as the least favored option, is the foundation of the integrated sustainability approach which covers three main aspects of waste management: (1) stakeholders, (2) sustainability aspects and (3) waste system elements. This approach aims to adopt practices which diverges an economy from a linear approach where resources are utilized overwhelmingly with minimal reutilization towards a circular economy. The circular economy necessitates a recuperative and regenerative system designed to close the loop of industrial production to ensure minimal waste disposal at landfills. be'ah embarked on a journey to close all traditional dumpsites that cause air, water, and soil pollution and replace them with high engineered landfills, where feasible. These cutting edge landfills which are compacted and lined are designed to prevent leachate from polluting the soil and underlining groundwater and accept municipal solid waste for final disposal in a secure and safe manner, minimizing the risk to people and the environment. be'ah also aims at expanding the base of "greener" service offerings, such as consulting with citizens on waste reduction, recycling, and planning to produce biogas from waste as a high-efficiency renewable fuel to replace fossil fuels that cause pollution. We set aside as buffer zones, we make a concentrated effort to promote the natural value of environment by providing habitat for wildlife through planting and cleaning, and offering environmental activities that promote sustainability. The Environmental Center of Excellence has been established to achieve a new momentum in driving a culture of sustainability within be'ah. We engage broadly, and at every level, with all the environmental entitled stakeholders to discuss the issues affecting the environment and the methods in which sustainability can be achieved at national and international levels.

Figure 1: Leachate collection in be'ah landfill

Figure 2: Delivering the message of sustaining the environment

Biography

Rahma Al Riyami has earned a Bachelor of Science in Chemical Engineering and a Master of Engineering in Environmental Engineering, both from University of Cincinnati, Ohio United States of America. She works as a Sustainable Development Executive. She is in charge of developing, implementing and monitoring company environmental strategies. She is also responsible for categorizing and tracing all environmental related issues arising from urban, industrial and commercial activities in the country, such as energy use, natural resource use, waste generation and recycling.

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Forest fire prevention through agricultural innovation in the ex-mega rice project area in Central Kalimantan

Susilawati

Central Kalimantan of Asessment Institute for Agricultural Technology, Indonesia

In 1995, the Government of Indonesia initiated the Central Kalimantan Peatland Development Project – commonly known as the Mega Rice Project - to convert up to one million hectares of peat and lowland swamp to rice cultivation. In order to prepare the land for cultivation the peatland was drained through the construction of thousands of kilometers of canals and forest was cut. The effects were very damaging for the environment as the soils dried and the forests degraded. Agricultural developments were largely unsuccessful in the difficult peat land conditions. Agriculture is traditionally being practiced on the mineral soils along the river. A diversity of food crops, estate crops and livestock is grown and reared in the area. The limited suitability of the peat lands for agriculture often has to do with the acidity of the soils. Much land is only suitable for a limited number of crops. This leads to low agricultural production resulting in poverty among local communities. Fire has traditionally been used for land clearing and is still a common tool for agricultural preparations and land clearing for other purposes. Farmers traditionally monitor fires as they burn to avoid spreading. However, when peat soils are dry and forests are degraded they easily catch on fire. This paper aims to reduce the incidence of forest fires through the introduction of innovative techniques that limit the use of fire in land clearing. These techniques taken from the climate smart agriculture approach will be able to support the local communities to diversify their farming methods and make use of the environmental circumstances in which they live to increase their agricultural production and improve their livelihoods. The result show that land clearing with limited use of fire have positive effects on agricultural production and can reduce the incidence of forest fires.

Biography

Susilawati is an Agronomic Researcher who has conducted research in the field, especially for food crops in sub-optimal land, such as swamps land, peatland and dry land. She is active to the introduction of superior rice varieties of environmental friendly to local communities. Management and utilization of plant genetic resources, prevention of land fires through cultivation activities, both nationally and internationally. Some of her innovations that have been produced include "Jajar Legowo Super" that specific on tidal swamp land, technology pf ratoon in rice cultivation on tidal land. She was the best researcher for local-specific research fields in 2017.

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Integrated water innovation

Anna Poberezhna
Smart4tech, UK

Current approaches to catchment management are fragmented, hence it is important to develop better value solutions focusing on circular economy and sustainability. I will discuss the integrated water resource management with a focus on the open source ecosystem & cross-sectoral stakeholders' engagement. The use of innovative technologies helps us not only to build more efficient or "smart" water systems; it enables us to build a new type of auditable framework based on trust and transparency. Whereas the design of modular and decentralised solutions can be faster developed, deployed and replicated.

Recent Publications:

1. Water Trade Finance chapter in the book Transforming Climate Finance and Green Investment with Blockchains, edited by Alastair Marke, 2018, Elsevier
2. Bloomberg Environment: Beyond Bitcoin: The Future of Pollution Tracking With Blockchain, June 27, 2018, David Schultz
3. Hashing out the future of blockchain for the water industry, Global Water Intelligence, Feb 2018,
4. The integrated water resource management, The Water Report, November 2018, Karma Loveday editor.

Biography

Anna is a strategic and innovation expert with a focus on the impact business, Sustainable Development, blockchain and green finance. Founder of Smart4tech – the key focus of the project to address water efficiency and security through the merge of the circular economy, innovation, and finance. Author of the Water Trade Finance chapter in the book Transforming Climate Finance and Green Investment with Blockchains. Contributor to the Bloomberg Environment, Global Water Intelligence, The Water Report and others.

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Sustainability is cool

Monika Poppy
Sustainability is Cool, UK

The marketing and PR of corporates and charities are drastically changing. No longer are social media and influencers only used for promoting and selling products but helping governments and projects raise awareness and implement ideas. The power of influencers and digital media is everywhere and through new tools its becoming scalable. There's been proven studies on how Persuasive power lies in expertise and social proof in followers with the same interests. Sustainability has become more than a niche movement through raising interest from the younger demographic through social media. Why is this the new route for marketers? Why is this an important and positive movement? How can your project benefit from using these channels? We will be looking at these points and the future prospects of social media influencing in the age of digital communication. We will also be looking at how Sustainability is cool was one of the pioneering platforms for implementing sustainable change and why Monika Poppy was chosen as one of the top influencers in Sustainability and the platform received social enterprise status.

Biography

Monika Poppy grew up between Sweden & London and has academic background in Energy & Sustainable development. In 2016 she started Sustainability is cool platform with the goal to make sustainability accessible to the general public through educating through reviewing sustainable brands and services. The purpose of the channels is to spread knowledge mainly targeted to audiences in urban areas. It's to simplify the knowledge and the resources of sustainable goods and services available whilst maintaining modern standards. Since then she has appeared on news and live appearances worldwide, worked with well known institutes and gathered a combination of over 20,000 followers on her social media channels that include both fellow sustainable leaders, famous institutes, brands and the general public.

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Air pollutants and environmental causes in London's air quality

Veronica Goncalves
UK

London air pollution correspond to a serious matter that drives to high levels of pollution and with health consequences for its citizens. Air pollution consist in the release of pollutants into the air. The air pollution has origin in the production and use of energy. The physical evidence of air pollution is determined by the presence of ground level ozone (smog) and particulate matter made of tiny particles of chemicals called soot. The air pollutants have two qualifications, the primary sources and secondary sources. The main primary pollutants is harmful in high concentrations, and are carbon compounds, such as Co, $C0_2$, CH_4, VOCs, nitrogen compounds etc. The particulate matter are categorized in solid or liquid form and measured buy their diameter. While the secondary sources result from chemical reaction between the primary sources themselves or with in reaction with other componds and are called photochemical oxidants and secondary particulate matter. Air pollution is explained and described with conscious regarding the levels of pollutant gases that are present in the atmosphere. The origin of gases are referred for identification of the pollution sources and understanding the challenges and questions to minimize air pollution.

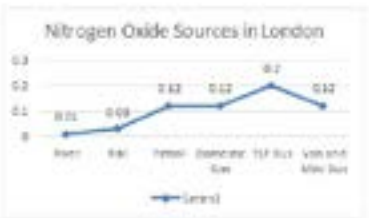

Figure 1: Levels and origin of the major source of air pollution in London.

Recent Publications:

1. Heather Walton et al. (2015) Understanding the heath impacts of air pollution in London. Greater London Authority. Pages:1-129.
2. Sean Beevers et al. (2009) Air pollution and emissions trends in London. King's College London, Environmental Research Group, Leeds University Institute for Transport studies. Pages:1-47

Biography

Veronica Goncalves has her expertise in communication and passion in the natural world and resources. Since 2012 she has been developing skills in personal development. In 2016 started to participate in conferences in the US, and made research in environment. With the new skills and professional experience that has been achieving while working in London would like to increase awareness about Climate Change and to be an example for other young generations.

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Air pollution a major factor in asthma predictability index among children living in and around Kolkata metropolis

Jayati Das[1] and **Saibal Moitra**[2]
[1]Shri Shikshayatan College and Jadavpur University, India
[2]Allergy and Asthma Research Centre, India

Asthma is the most common pediatric chronic disease. Hindrance in asthma diagnosis is widespread resulting in unsatisfactory management in asthma. About 80% of pediatric asthma patients have symptom onset before age six, most of them before age three. However, only about 1/3 of children with at least one episode of asthmatic symptoms by age three will have asthma at age six and over. Asthma is under-diagnosed in 18-75 % of asthmatic children. Kolkata is categorized unhealthy for human beings. Deterioration in urban air quality in most megacities is quite profound and this city is no exception to this. An assessment of Kolkata air quality is done where the listed pollutants' (RPM, SPM, NO_2 and SO_2) annual average concentration are classified into four different categories; namely critical, high, moderate and low pollution. There are 17 monitoring stations in Kolkata and out of which five fall under the critical category, and the remaining 12 locations fall under the high category of NO_2 concentration; regarding RPM, four stations are critical and 13 stations record data which are under the high pollution category. Model questionnaires were run through 10% of the households to assess socio-economic conditions, critical environmental conditions, nature and types of health burdens as well as gauge the attitude in the direction of healthcare facilities were done. A comprehensive and up-to-date knowledge about the seasonal and spatial variation of asthma and studying air quality of the area was carried out. Mapping through GIS was done. It is desirable to construct an accurate model (Asthma Prediction Index) to predict whether a child will develop asthma in the future due to the deteriorating air pollution in the city.

Figure-Asthma prediction for children with atopic parents

Recent Publications:

1. Moitra S et al. (2016) Respiratory morbidity among Indian tea industry workers. International Journal of Occupational and Environmental Medicine 7(3):148-155.

2. Moitra S et al. (2015) Exposure associated respiratory impairments among Indian tea industry workers. European Respiratory Journal 46: OA2915

Biography

Jayati Das is currently a Postdoctoral Research Fellow at the Jadavpur University, Kolkata (India). She is also a teaching Faculty at Shri Shikshayatan College and Calcutta University. She holds the post of Secretary of Allergy and Asthma Research Centre, Kolkata a well-known NGO. She has completed 3 projects in health geography. She has 30 research papers published in renowned geographical journals in India and abroad. Besides research and teaching she is involved in social work mainly for the under privileged children in Kolkata.

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Source apportionment of the redox activity of urban fine particulate matter in Athens, Greece

Constantinos Sioutas[1], Sina Taghvaee[1], Mohammad H Sowlat[1], Evangelia Diapouli[2], Manousos Ioannis Manousakas[2], Vasiliki Vasilatou[2] and **Kostas Eleftheriadis[2]**

[1]University of Southern California, USA

[2]Institute of Nuclear and Radiological Sciences & Technology, Energy & Safety, Greece

In this study, we performed chemical characterization and source apportionment of the oxidative potential of airborne particulate matter <2.5 μm in diameter particulate matter ($PM_{2.5}$) at a residential, urban background (UB) site in the outlying neighborhood of Demokritos (Greece). To this end, weekly time-integrated $PM_{2.5}$ samples were collected during summer (July-September), and winter (February-March). PM samples were then analyzed for chemical composition, and the *in vitro* alveolar macrophage assays were performed to determine PM oxidative potential. Chemical analysis was done for metals, water-soluble organic carbon (WSOC), elemental and organic carbon (EC/OC), and markers of biomass burning (e.g. levoglucosan). The Spearman rank-order correlation analysis was then used along with the principal component analysis (PCA), and multiple linear regression (MLR) to apportion the redox activity of $PM_{2.5}$ into its contributing sources. Results of this study indicated that the intrinsic (mass-based) and extrinsic (volumetric) oxidative potentials of ambient $PM_{2.5}$ in urban background region of Athens was noticeably higher than PM redox activity in many metropolitan areas of the world. In addition based on MLR results, traffic emissions (characterized by EC), secondary organic aerosols (SOA) (characterized by WSOC), and biomass burning (identified by levoglucosan) were the major sources contributing to 44%, 16%, and 9% of the PM oxidative potential respectively. Higher oxidative potential levels were also observed in warm phase than cold period, due mainly to higher concentrations of EC, and WSOC during warm season. Results of this study reveal the most significant $PM_{2.5}$ sources which are responsible for PM-induced toxicity and thus can be used by policy makers and public health authorities to adopt appropriate policies regarding detrimental health impacts of $PM_{2.5}$.

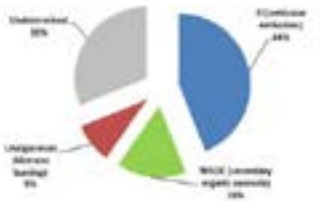

Figure 1: Source apportionment of the redox activity of urban fine particulate matter.

Recent Publications:

1. Diapouli E et al. (2017) Evolution of air pollution source contributions over one decade, derived by PM 10 and PM 2.5 source apportionment in two metropolitan urban areas in Greece. Atmos. Environ. 164:416-430.
2. Shirmohammadi F et al. (2018) Chemical composition and redox activity of PM 0.25 near Los Angeles International Airport and comparisons to an urban traffic site. Sci. Total Environ. 610-611:1336–1346.
3. Landreman A P et al. (2008) A macrophage-based method for the assessment of the reactive oxygen species (ROS) activity of atmospheric particulate matter (PM) and application to routine (Daily-24 h) aerosol monitoring studies. Aerosol Sci. Technol. 42:946-957.

Biography

Constantinos Sioutas is the Fred Champion Professor of Civil and Environmental Engineering Department at University of Southern California (USA). He has completed ScD in Environmental Engineering from Harvard University. His area of expertise includes development of several particle sampling technologies that have enabled the assessment of the relative toxicity of particulate matters using realistic atmospheres in *in-vivo* and *in-vitro* exposure studies funded by US Environment Protection Agency, National Institute of Health and California Air Resources Board in Southern California. Findings from his work have also been extensively used in the revision of US EPA national air quality standards on particulate matters.

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Separation and retention of some textile dyes in natural water employing polyurethane foams

Ahmed Talaat Tawfik
Dhafarah Region Municipality, UAE

In recent years, the growth of the human population of the world causes not only serious problems of food and resources, but also brings the encroachment of the natural ecosystem. Thus, with a heightened sense and increased awareness of environmental responsibility comes a need for removal or minimizing the organic pollutants in industrial wastes. Industrial wastes in the form of solid, gas and liquid effluents represent one of the most serious problems of environmental pollution and necessitate strict control and appropriate treatment processes. The resilient open cell polyurethane foam represents an efficient separation and preconcentration medium for the investigated textile dyes in diluted aqueous solutions. The kinetics, mechanisms and thermodynamics characteristics of the sorption steps of the dyes onto polyurethane foam are also considered. The proposed methods permit rapid and effective separation of sandolane dye from water samples at relatively high flow rate without loss in column performance. Overall, the results of this study provide a deeper insight into the mechanism of extraction of some textile dyes by polyurethane membrane and show that the PUFs membrane has a considerable potential in commercial applications for removal of some textile dyes from industrial effluents.

The applicability of the proposed foam column method for quantitative collection and recovery of sandolane from natural and underground water as a case study was critically investigated. A one liter of tap or underground water sample spiked with sandolane at 1-5 μg/cm^3 concentration level was percolated through the foam column at 10 cm^3/min flow rate. More or less complete extraction of the tested dye was achieved quantitatively as indicated from the effluent solutions. The retained species were also successfully recovered with 50 cm^3 acetone at 5 cm^3/min flow rate. The breakthrough curves of sandolane spiked to tap and underground water samples are presented in Fig.1. The results revealed excellent extraction 98% and recovery percentages even if samples contain high content of dissolved solids.

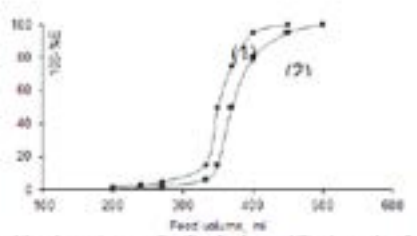

Fig. 1: Breakthrough capacity curves of tap (1) and underground (2) water samples spiked with sandolane (1 ppm) onto unleached PUF packed column at 10 cm^3 mean flow rate and 25± 0.5°C

Recent Publications:

1. Lucyna Bilińska, Kazimierz Blus, Marta Gmurek, Stanisław Ledakowicz (2019) Coupling of electrocoagulation and ozone treatment for textile wastewater Reuse Chemical Engineering Journal 358:992–1001.

2. Simone Haslinger, Sami Hietala, Michael Hummel, Sirkka Liisa Maunu, Herbert Sixta (2019) Solid-state NMR method for the quantification of cellulose and polyester in textile blends Carbohydrate Polymers 207:11–16.

3. Ridha Lafi, Lassaad Gzara, Ramzi Hadj Lajimi, Amor Hafiane (2018) Treatment of textile wastewater by a hybrid ultrafiltration/electrodialysis Process Chemical Engineering & Processing: Process Intensification 132:105–113.

4. Aseel M. Aljeboree, Abbas N. Alshirifi, Ayad F. Alkaim (2017) Kinetics and equilibrium study for the adsorption of textile dyes on coconut shell activated carbon Arabian Journal of Chemistry 10, S3381–S3393.

5. Ayesha Wasti, M. Ali Awan (2016) Adsorption of textile dye onto modified immobilized activated alumina Journal of the Association of Arab Universities for Basic and Applied Sciences 20:26–31.

6. Mohammadine El Haddad, Rachid Slimani, Rachid Mamouni, Saı¨d ElAntri, Saı¨d Lazar (2013) Removal of two textile dyes from aqueous solutions onto calcined bones Journal of the Association of Arab Universities for Basic and Applied Sciences 14:51–59.

Biography

Ahmed Talaat Tawfik has diverse experiences in environmental control and treatment. He has worked in Egyptian Environmental Affairs Agency since 2000 as environmental researcher and have several papers in environmental treatment. Ahmed Talaat Tawfik has established environmental system management for different organization to implement, monitor and control the environment in Egypt and UAE. Dr Ahmed Talaat Tawfik has received many appreciation awards from Egyptian minister and UAE ministers.

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Trends of hydroclimate variables in the upper Huai river basin

Abel Girma[1], **Denguha Yan**[2] and **Dadim Fikir**[3]
[1]Donghua University, China
[2]China Institute of Water Resources and Hydropower Research, China
[3]University of Padova, Italy

The present study attempted to investigate the trends of mean annual temperature, precipitation, and streamflow changes to determine their relationships in the upper Huai river basin. The Mann-Kendall (MK), Sen's slope test estimator and Innovative trend detection (ITA) methods were used to detect the trends. According to the finding average annual precipitation shows a descending trend in Xiangcheng (ϕ=-0.33), Zhumadian (ϕ=-0.60), Gushi (ϕ=0.35), Xinyang (ϕ=-0.32), and Xichong (ϕ=-0.11) stations. An increasing trend was found only in Fuyang station (ϕ=1.02). In all stations, the trends of mean annual temperature in Xiangcheng (ϕ=0.30), Zhumadian (ϕ=0.45), Gushi (ϕ=0.45), Fuyang (ϕ=0.36), Xinyang (ϕ=0.38) and Xichong (ϕ=0.45) was abruptly increased. During the past 56 years, the mean air temperature has considerably increased by 1.2°C. The river streamflow showed a dramatic declining trend in all stations for the duration of the study period (1960-2016) (ϕ=-4.29). The climate variability in the study region affects the quantity of the streamflow. The outcomes of this study could create awareness for the policymakers and scientific community about the hydro-climatic evolutions across the study basin and become an inordinate resource for advanced scientific researches.

Recent Publications:

1. Abiyu, A., Yan, D., Girma, A., Song, X., & Wang, H. (2018). Wastewater treatment potential of Moringa stenopetala over Moringa olifera as a natural coagulant, antimicrobial agent and heavy metal removals. Cogent Environmental Science, 4(1), 1433507.
2. Yang, C., Girma, A., Lei, T., Liu, Y., & Ma, C. (2016). Study on simultaneous adsorption of Zn(II) and methylene blue on waste-derived activated carbon for efficient applications in wastewater treatment. Cogent Environmental Science, 2(1), 1151983.
3. YAN D., XU T., GIRMA A. Regional Correlation between Precipitation and Vegetation in the Huang-Huai-Hai River Basin, China. Water, 9 (8), 557, 2017.
4. Gedefaw, M.; Yan, D.; Wang, H.; Qin, T.; Girma, A.; Abiyu, A.; Batsuren, D. Innovative Trend Analysis of Annual and Seasonal Rainfall Variability in Amhara Regional State, Ethiopia. Atmosphere 2018, 9, 326.
5. Dorjsuren, B.; Yan, D.; Wang, H.; Chonokhuu, S.; Enkhbold, A.; Yiran, X.; Girma, A.; Gedefaw, M.; Abiyu, A. Observed Trends of Climate and River Discharge in Mongolia's Selenga Sub-Basin of the Lake Baikal Basin. Water 2018, 10, 1436.Room R, BaborT, Rehm J (2005) Alcohol and public health. Lancet.

Biography

Abel Girma is a PhD candidate since 2015 at the College of Environmental Science and Engineering, Donghua University, Shanghai. Abel holds his MSc degree in Environmental Science form Addis Abeba University Ethiopia, in the year 2013 and a BSc degree in Plant Science form Arbaminch University Ethiopia, in the year 2010. Abel has been splendor and highest scorer alumna out of all graduates of Plant Science departments, distinguished from student peers with a track record of superior academic results. Arbaminch University acknowledged and praised me a medal for my very great distinction performance. Abel's research interest is related to climate change and water resource allocation with low carbon mode. Abel has a total of 12 publications (7 Sci papers).

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