



6th World Conference on Climate Change

September 02-03, 2019 | Berlin, Germany

Scientific Tracks & Abstracts Day 1

Climate Change 2019



SESSIONS

Climate Change Challenges & Sustainability | CO₂ Capture and Sequestration | Green Economy Renewable Energy | Climate Change: Marine Life | Climate Changing Cloud Heights | Vital Signs of the Planet Mitigation and Adaptation

Chair: Peter M. Leitner, National Intelligence University, USA

Co-Chair: Mehdi Azadi, The University of Queensland, Australia

SESSION INTRODUCTION

Title: **Associating Marginal Abatement Cost Curves (MACC) for greenhouse gas emissions from the agriculture of Latvia with carbon sequestration data**

Kaspars Naglis-Liepa, Latvia University of Life Science and Technologies, Latvia

Title: **Long-term effects of residential rainfall levels on post heavy-rainfall waterborne disease hospitalizations in young children in New Zealand**

Hakkan Lai, University of Auckland, New Zealand

Title: **Forest management and C-allocation of beech (*Fagus sylvatica*)**

Johannes Eichhorn, The Nordwestdeutsche Forstliche Versuchsanstalt, Germany

Title: **Climate change in three different zones in Algeria**

Nabila Ihaddadene, M'Sila University, Algeria

Title: **Mineralization of CO₂ for carbon sequestration using flue gas desulphurization gypsum**

Jonathan Riddle, The University of Alabama, USA

Title: **Urban green and vegetation growth in Košice – case study**

Zuzana Poorova, Technical University of Kosice, Slovakia

Title: **Recycling of electronic battery by the households. Differences of awareness and active participation between Russia and leading-recycling European states**

Sofya Khlebnikova, International University in Geneva (IUG), Switzerland

Title: **Climate change: Myths, realities and prospects of a global deal to curb climate change**

A W Jayawardena, The University of Hong Kong, Hong Kong

Title: **Climate change, its effects and possible solutions on our environment**

Yakubu Muntaka Musah, Y M Ventures, Ghana



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Associating Marginal Abatement Cost Curves (MACC) for greenhouse gas emissions from the agriculture of Latvia with carbon sequestration data

Kaspars Naglis-Liepa, Arnis Lenerts, Dina Popluga and Dzidra Kreismane
Latvia University of Life Science and Technologies, Latvia

Statement of the Problem: Environmental preservation is one of the EU multifaceted policy priorities that influences all the other policies, among them agricultural (European Commission, 2011). Agriculture plays an essential role in environmental preservation and in shaping climate policies. The agriculture of Latvia is the second largest source of greenhouse gas (GHG) emissions, accounting for 24.2% of the total emissions produced in the country (Latvia's National Inventory Report, 2017). All the sectors of the economy have to contribute to the reduction of GHG emissions.

Methodology & Theoretical Orientation: A popular way how to analyse GHG emission abatement measures is to use a marginal abatement cost curve (MACC) that ranges the measures according to their costs and emission reduction potential. The present research focuses on the MACCs designed for Latvia in relation to agricultural emission reduction measures, which were complemented by two new measures, i.e. "paludi culture crops (reed (for construction)) on arable land with organic soils" and "establishment of permanent crops (highbush blueberry) in organic arable land", that are associated with land use and land use change. Besides, the research analysed 23 measures, revealing their effects on both the agricultural and the LULUCF sectors.

Findings: The overall conclusion was that the interaction of most of the measures was neutral (12 measures). Only three measures made positive effects on both sectors, meaning GHG emission reductions in both sectors. The effects of two measures were unclear, as there was a lack of relevant research investigations. However, a negative interaction was found for six measures, which was mainly due to the fact that an increase in green biomass produced by the agricultural sector would result in additional emissions, while the LULUCF sector would increase CO₂ sequestration because of the increase in green biomass.

Conclusion & Significance: The research found that some of the measures incorporated in the complemented MACCs had potential for CO₂ sequestration and C accumulation along with the potential for GHG emission reduction



Recent Publications

1. Kreismane Dz, Popluga D, Berzina L, Naglis-Liepa K, Lenerts A, Rivza P (2017) Organic farms and agricultural GHG emissions in Latvia // Organic Eprints: NJF Report. (NJF Seminar 495). Vol. 13 No. 1 : 4th Organic conference proceedings "ORGANICS for tomorrow's food systems" p 139-141pp

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2. Naglis-Liepa K, Popluga D, Lenerts A, Rivza P, Kreismane Dz (2018) Integrated impact assessment of agricultural GHG abatement measures. Proceedings of the International scientific conference "Economic science for rural development", Jelgava, May 9-11, 2018 / Latvia University of Life Sciences and Technologies. Faculty of Economics and Social Development. Jelgava, 2018. Nr. 49: Bioeconomy. Finance and Taxes. Home Economics. New Dimensions in the Development of Society, p. 77.-83.
3. Naglis-Liepa K, Popluga D, Rivza P (2015) Typology of Latvian agricultural farms in the context of mitigation of agricultural GHG emissions / // 15th International multidisciplinary scientific GeoConference SGEM2015 "Ecology, economics, education and legislation" : conference proceedings, Albena, Bulgaria, 18-24 June, 2015 / Bulgarian Academy of Sciences. Sofia, 2015. Vol. 2 (5) : Ecology and environmental protection, p. 513-520..
4. Popluga D, Naglis-Liepa K, Lenerts A, Rivza P (2017) Marginal abatement cost curve for assessing mitigation potential of Latvian agricultural greenhouse gas emissions: case study of crop sector /. Energy and clean technologies; Vol.17 Issue 41: Nuclear technologies. Recycling. Air pollution and climate change, p. 511-518.
5. Naglis-Liepa K, Popluga D, Lenerts A, Kreismane Dz, Rivza P (2018) Marginal abatement cost curves in analyzing GHG emissions from agricultural holdings in Latvia: the cluster approach (2018) // 26th NJF congress "Agriculture for the next 100 years" programme and summaries of presentation, Kaunas, Lithuania, 27-29 of June, 2018 / Aleksandras Stulginskis University, Lithuanian Research Centre for Agriculture and Forestry, Lithuanian Academy of Sciences. Kaunas, 2018. p.30.

Biography

Kaspars Naglis-Liepa is assistant professor and researcher at Latvia University of Life Science and Tehnologies Faculty ond Economics and Social Development. Scientific interest: Bioeconomics, bioeconomy, circular economy, GHG, ammonium emission reduction, Member of Research Group for GHG emission abatement studies.

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Long-term effects of residential rainfall levels on post heavy-rainfall waterborne disease hospitalizations in young children in New Zealand

Hakkan Lai, Caroline Walker, Alistair Woodward, Peter Tricker and Susan Morton
University of Auckland, New Zealand

Climate change models have recently projected increased heavy rainfall events in both wet and dry regions. It is well established that heavy rainfall events are associated with increased risks of waterborne diseases (WD). However, there is a paucity of epidemiological evidence for how wet and dry regions influence the risk of WD due to heavy rainfall. In New Zealand, the annual total rainfall can differ by up to 3500mm in different locations. We aimed to determine if residing in wet or dry regions was associated with the risk of experiencing WD immediately following heavy rainfall. Using our cohort of 6853 children born between 2009 and mid-2010 in New Zealand, we defined possible WD hospitalization if the primary and/or secondary causes were intestinal infections (ICD10:A00-09), non-intestinal *E. coli* infections (B96.2), leptospirosis (A27), mycobacterial infections (A31), adenovirus (B97.0), enterovirus (B97.1), and/or unspecified-site viral infections (B34). We only considered admissions within a lag window of 1-4 days after the heavy rainfall dates to ensure short-term temporality. To define wet or dry regions, we assessed time-weighted long-term exposure using median annual rainfall levels at individual home locations at five different data collection time points. We used logistic regression model adjusted for child's sex, ethnicity, rurality and individual deprivation. Based on the third quintile of residential long-term rainfall level, the adjusted odds ratios [95%CI] of post heavy-rainfall WD hospitalizations in the dry (first, second) and wet regions (fourth and fifth quintiles) were 1.84 [1.08-3.14], 1.23 [0.70-2.17], 1.35 [0.77-2.37] and 2.24 [1.25-4.01] respectively. A U-shape exposure-response relationship was found (quadratic trend P-value = 0.002). Living in the wettest and driest rainfall locations were both associated with childhood WD hospitalizations shortly after heavy rainfall dates. We suggest a need to review preventive policy to address the rainfall-associated WD risks among residents in vulnerable locations.

Recent Publications

1. Lai, H. K., Camargo, C. A., Woodward, A., Hobbs, M., Pillai, A., Morton, S. M., Grant, C. C. (2019). Long-term exposure to neighborhood smoke from household heating and risk of respiratory and dermatological prescription medications - Growing Up in New Zealand child cohort study. *Allergy* 74:391-395.
2. Morton, S. M., Lai, H. K. (2018). Growing Up in New Zealand: Health research project - Drinking water quality and child health. In *Water New Zealand Conference & Expo 2018*. Hamilton, New Zealand.
3. Lai, H. K., Berry, S. D., Verbiest, M. E., Tricker, P. J., Atatoa Carr, P. E., Morton, S. M., & Grant, C. C. (2017). Emergency department visits of young children and long-term exposure to neighbourhood smoke from household heating - The Growing Up in New Zealand child cohort study. *Environmental Pollution* 231(Pt 1), 533-540.

Biography

Before starting post-doc research in environmental health in Hong Kong, Dr Hakkan Lai obtained a PhD in environmental exposure and modelling (UK, 2005). In 2014 he moved to New Zealand, and in 2015 he joined the University of Auckland School of Population Health, initially in the Section of Epidemiology and Biostatistics for a study related to biodiversity, green space and active transport. In 2016, Hakkan joined the Growing Up in New Zealand (GUINZ) cohort study. Hakkan's research focuses on spatial and temporal distribution of environmental exposures and various health outcomes including diseases of cardiovascular, respiratory, gastrointestinal, dermatological and oncological outcomes

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Forest management and C-allocation of beech (*Fagus sylvatica*)

Johannes Eichhorn and Caroline Klinck

The Nordwestdeutsche Forstliche Versuchsanstalt, Germany

Statement of the Problem: Does forest management contribute towards assuring carbon storage in beech forests? Forests store carbon to a large extent above and below ground. Solid volume beech shows a high increasing above-ground C supply of about 120 t C/ha. The below-ground value is about 160 t C/ha (excluding moors; Evers et al., 2019, Wördehoff et al., 2011)). The stability of C-supplies in forests depends mainly on the vitality of above-ground biomass. As exemplary indicators the annual mortality rate, fructification and the foliation of beech are presented.

Methodology and Theoretical Orientation: The basis of the data stems from the forest monitoring in north-west German federal states ranging from 1984 up to now (2018). Governing indicators: atmospheric conditions and meteorological variables, forest management information. Evaluation through resilience analysis, deduction of decision-making guidance for forest management.

Findings: Annual mortality is an essential indicator of tree vitality. The so-far low mortality rate of beech remained unchanged up to the end of 2018 despite that year's drought; an indication of the high adaptability of beech to changing environmental conditions. The C-allocation of beech is a contributing factor. Three impact-indicators are to be presented, and also C-sinks: fructification, foliation, and diameter increment.

Fructification Beech (in Hesse) fructifies at present at shorter intervals (1988 to 2018 there was a mast every 2.6 years; 1839 to 1987: 4.7 years (Paar et al., 2011), widely synchronised over a number of locations. A significant reason for this is global radiation. But also influences which can be controlled by forest management (Jandi et al.: 2007, Jarvis, 2005).

Sink properties through growth and interaction In 2018, Beech diameter growth starts above average. However, growth ends and remains absent from mid of June on water limited sites (Wagner et al. 2019). There is a connection between diameter increment and weather conditions, as well as interaction with fructification.

Conclusion and Significance: So far annual beech mortality is low, yet external influences cause alterations in the C-allocation but without exceeding threshold values of stable sylvan development. More frequent fructification supports a more natural sylvan development with natural rejuvenation, mixed forest structures and multi-functional forests (WBGU, 2009; Jarvis, 2005). Taking possible long-term consequences of the extreme summer of 2018 into account, this positive result for beech must be regarded with a question mark.

Recent Publications

1. Evers, J.; Dammann, I.; König, N.; Paar, U.; Stüber, V.; Schulze, A.; Schmidt, m.; Schönfelder, E., Eichhorn, J. (2019): Waldbodenzustandsbericht für Niedersachsen und Bremen. Ergebnisse der zweiten Bodenzustandserhebung im Wald (BZE II). Berichte aus der Nordwestdeutschen Forstlichen Versuchsanstalt Band 19. 498 pp.
2. Wördehoff, R., Spellmann, H.; Evers, J.; Nagel, J. (2011): Kohlenstoffstudie Forst und Holz Niedersachsen. Beiträge aus der Nordwestdeutschen Forstlichen Versuchsanstalt Band 6 Universitätsverlag Göttingen. 104 pp.
3. Jandi, R.; KLindner, M.; Vesterdal, L.; Bauwens, B.; Baritz, R.; Hagedorn, F.; Johnson, D.; Minkkinen, D.W.; Byrne, K.; (2007): How strongly can forest management influence soil carbon sequestration? Geoderma 137, 253-268.
4. Jarvis, P.G.; Ibrom, A.; Lindner, S. (2005): Carbon Forestry: managing forests to conserve carbon. In: Griffiths,

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H.; Jarvis, P.G. (Hrsg.): The Carbon Balance of Forest Biomes. Taylor and Francis Group Oxford, 331-349

5. Wagner, M., Scheler, B., Suttmöller, J., Dammann, I., Paar, U., Meesenburg, H., Eichhorn, J. (2019): Die extreme Trockenheit in Nordwestdeutschland, Teil 2. AFZ-DerWald 6/2019 47-50.

Biography

Director of Department Forest Environment Control, North West German Research Station, Göttingen, Germany.

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Climate change in three different zones in Algeria

Nabila Ihaddadene¹, Razika haddadene¹ and Marwan Mostfaoui²

¹M'Sila University, Algeria

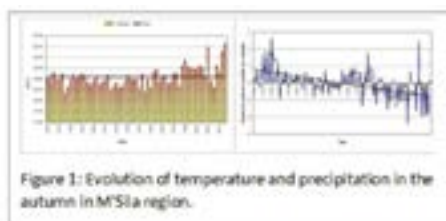
²M'Sila Weather Meteorological Station, Algeria

Statement of the Problem: Climate change felt by people around the world is a consequence of the excessive use of conventional energy sources. Greenhouse gases, especially CO₂ released when using fossil fuels is responsible for the warming of the earth. Climatology is the study of climate, which is the sequence of weather conditions over long periods. Precipitation and temperature are the two fundamental variables used in describing climate change.

Methodology & Theoretical Orientation: This investigation examines air temperature and precipitation trends of three regions of Algeria namely; M'Sila, Biskra, and In-Amenas from 1950 to 2003. M'Sila is a province (wilaya) of northern Algeria. It is located at 35°40'N and 04°30'E. Its average height from sea level is 441 m. Biskra is a province (wilaya) of southeast Algeria. It is sited at 34°51'N and 05°44'E. Its average height from sea level is 87 m. In Amenas is a town and municipality of southeast Algeria. It is located at 28°02'N and 09°33'E. Its average height from sea level is 600 m.

Findings: It was found that the warming trend was particularly enhanced over these regions for all seasons (autumn, winter, spring and summer). Annual rainfall of M'Sila and In Amenas was reduced, however, Biskra knows a slight increase in rainfall. For all regions studied, autumn in recent years loses its characteristics of the agricultural season since it records a lack of precipitation. In contrast, summer season generally characterized by a lack of rainfall lately knows a slight increase. Spring and winter of M'Sila know a lack in rainfall. Whereas in Biskra and In Amenas they record a slight increase.

Conclusion & Significance: As a result of warming, M'Sila presents an aridity trend. It was a semi-arid area, and is now ranked in the arid zone. The zones of Biskra and Amenas remain arid. In fact, air warming is affected by the soil cover.



Recent Publications

1. N, Ihaddadene R, Betka A (2018) Experimental investigation of using a novel insulation material on the functioning of a solar thermal collector. *Journal of Solar Energy Engineering* 140 (6), 061001.
2. Ihaddadene N, Ihaddadene R, Betka A, Beghidja A.H (2017) Experimental study of the effect of soil type on global warming using laboratory thermal collector. *International Journal of Hydrogen Energy* 42 (30): 19576-19582.
3. Ihaddadene N, Ihaddadene R, Charik A (2017) Best Tilt Angle of Fixed Solar Conversion Systems at M'Sila Region (Algeria). *Energy Procedia* (118): 63-71.

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4. Ihaddadene R, Ihaddadene N and Mostefaoui M (2016) Estimation of monthly wind speed distribution basing on hybrid weibull distribution. World Journal of Engineering (WJOE).13 (6).
5. Ihaddadene N, Ihaddadene Razika, Batka A (2016) Effect of Glass Superposition on the Efficiency of the ET200 Flat Plate Solar Collector. Intenational Journal of Electronics and Electrical engineering 4 (2).

Biography

Nabila Ihaddadene is an Associate Professor at the University of M'Sila since 2014, Chair of the Scientific Committee of the Department of Mechanical Engineering at the University of M'Sila, Head of Research Team at the Laboratory of Renewable Energy and Sustainable Development (LRESO) affiliated to Mentouri Brothers University of Constantine, Algeria. She received the PhD Degree in Biomechanics, from Ferhat Abbas University, Sétif (Algeria) in 2009. She received M.S. Degree in Engineering Process from Polytechnic Military School (EMP), Bordj El Bahri, Algiers (Algeria) in 2001. Member of the reading committee of the International Congress of Renewable Energy IREC (Tunisia) and other international conferences. She published in peer-reviewed journals including International Journal of Hydrogen Energy, Journal of Solar Energy Engineering, Energy Conversion, and management. Her research interest focus on renewable energies, thermal buildings, nutrition, medicinal plants and the well-being of the living.

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Mineralization of CO₂ for Carbon Sequestration using Flue Gas Desulphurization Gypsum

Jonathan Riddle and Rona J. Donahoe
The University of Alabama, USA

Past efforts for carbon sequestration using CO₂ mineralization have proven effective for long-term stable storage of CO₂ but were prohibitive due to slow reaction rates and high cost. Recent mineralization studies reacting flue gas desulphurization (FGD) gypsum (CaSO₄•2H₂O) with CO₂ in an alkaline solution, have shown conversion of gypsum into calcium carbonate (CaCO₃) to be a rapid and effective method for carbon sequestration. However, these studies used sodium hydroxide and ammonia to increase solution pH. The use of ammonia makes this mineralization method inefficient due to the production of ammonia being a significant CO₂ source. The goal of this study was to obtain high FGD gypsum-to-calcite conversion percentages at ambient temperature while eliminating the need for ammonia. A stirred reactor was utilized to study the effects of P_{CO₂} (10, 30, 60, and 250 psi), solution pH (12, 13, 13.5 and 14), solid-to-solution ratio (1:100, 1:80, 1:40, 1:100), and reaction time (10, 15, 30, and 120+ minutes) variation on the rate of conversion. The amount of carbonate produced was calculated from Rietveld refinement of XRD patterns to determine the impact of each variable. Experimental results showed varying degrees of FGD gypsum to CaCO₃ conversion. Solution pH was a primary control on conversion rates, with complete conversion occurring under all conditions at pH 13.5 and 14. Time also played a significant role in conversion rates, from 0% conversion at pH 13 after 360 minutes of reaction time, to approximately 75% conversion at pH 13 after 15 minutes of reaction time. The most cost-effective conversions took place at low P_{CO₂} (10 psi), pH 13 and a reaction time of 15 minutes, with a conversion rate of around 75%. The results of this study demonstrate that FGD gypsum can serve as a viable feedstock for CO₂ mineralization, potentially providing an inexpensive method for carbon sequestration.

Biography

Jonathan Riddle received a bachelor's degree in science at the University of North Alabama. After receiving his degree, he took a hiatus of four years to teach English in Japan. Afterwards, he decided to continue his geologic career and is currently a master's student at the University of Alabama. He began studying environmental issues and was awarded the Outstanding Research Paper from Geosyntec in 2018. He has been working with his professor, Dr. Rona Donahoe, on carbon mineralization. His is currently investigating more effective ways to use flue gas desulphurization gypsum for CO₂ sequestration. He will be finishing his master's degree in December of this year in environmental geochemistry.

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Urban green and vegetation growth in Košice – Case study

Zuzana Poorova and Zuzana Vranayova
Technical University of Kosice, Slovakia

Statement of the Problem: The need to house population in urban areas is expected to rise to 66% in 2050, according to United Nations. The replacement of natural permeable green areas with concrete constructions and hard surfaces will be noticed. The densification of existing built-up areas is responsible for the decreasing vegetation, which results in the lack of evapotranspiration cooling the air. Such decreasing vegetation causes urban heat islands. Since roofs and pavements have a very low albedo, they absorb a lot of sunlight.

Methodology & Theoretical Orientation: The ideal way to measure any city's heat island would be to examine regional weather patterns with and without the city in the place. Measuring heat island's effects on regional climate is useful, but it cannot tell how effective mitigation measures would be at reducing a heat island's effect. This is where modeling becomes necessary. Models are used to predict how well mitigation measures can reduce urban temperatures, energy use, air pollution and retain water. The simplest and the most common way to analyze a heat island is to compare existing weather data from two or more fixed locations.

Findings: Several studies have shown that natural and permeable surfaces, as in the case of green roofs, can play crucial role in mitigating this negative climate phenomenon and providing higher efficiency for the building, leading to savings. Such as water saving, what is the main idea of this research. Green roof advantages concerning water management include the attenuation of flood peaks in extreme rain events due to stormwater runoff delay, acting like a meanders of the river through water storage in the layers of the green roof, and reduction into the public drainage system. Water distress is an issue, which has brought an attention on the possibility using green roof structures to manage stormwater and allow their storage for later reuse. In Portugal, ANQIP (Associação Nacional para a Qualidade nas Instalações Prediais) has developed a Technical Specification: ETA 701 for rainwater harvesting in buildings, being a valuable tool to couple with the green roof technology.

Conclusion & Significance: Green roofs have the potential to be the most common type of green structures in the city due to their characteristics, low maintenance and low weight to the buildings.



Figure- 1 Predicting map of urban green and vegetation growth in Košice

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Recent Publications

1. Gartland, L. (2011) Heat Islands. Understanding and Mitigating Heat in Urban Areas. London, Earthscan.
2. Monteiro, C. M., Calheiros, C.S. C., Pimentel-Rodrigues, C., Silva-Afonso, A., Castro, M. L.P. (2016) Green roofs as a tool to promote water efficiency in buildings, IAHS World Congress on Housing. Coimbra: Institute for Research and Technological Development in Construction Sciences, p. 1-8. - ISBN 978-989-98949-4-5.
3. United Nations (2014) World urbanization prospects: The 2014 Revision (Highlights). United Nations-Department of Economic and Social Affairs, New York, 2014.
4. Konasova, S. (2016) The efficiency of green roofs to mitigate urban heat island effect in Rio de Janeiro Advances and Trends in Engineering Sciences and Technologies II, Taylor & Francis Group, CRC Press 2016 SBN: 978-1-138-03224-8.
5. Niachou, A., Papakonstantiou, K., Santamouris, M., Tsangrassoulis, A., Mihalakakou, G. (2001) Energy and Buildings, 33. Analysis of the green roof thermal properties and investigation of it energy performance, p. 719-729.
6. ANQIP (2012) Portuguese Association for Quality and Efficiency in Building Services. Technical Specification ETA 0701 - Rainwater harvesting systems in buildings (version 8)

Biography

Zuzana Poorova is architect and assistant professor at the Institute of Architectural Engineering, Faculty of Civil Engineering, Technical University in Kosice. She is specialized in green infrastructures - green roofs and walls and their retention qualities in terms of city urbanism, heat island and climate change. Focusing on current issues such as sponge city.

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Recycling of electronic battery by the households. Differences of awareness and active participation between Russia and leading-recycling European states

Sofya Khlebnikova

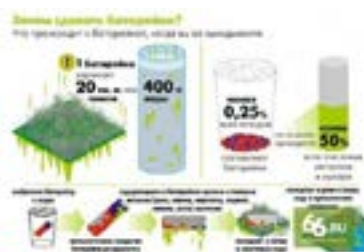
International University in Geneva (IUG), Switzerland

Statement of the Problem: Hazardous Household Waste presents a threat to the environment and to human health when the mixed garbage disposed of in landfills. In case of Russia, researchers have reported that at present, federal law does not regulate the management of waste batteries generated by the population, in particular, does not establish the requirement for their collection. Therefore, thrown into the household trash, batteries corrode and the toxins from metals go to the ground, water and the atmosphere. The number of oncological sicknesses has almost doubled in Russia in 2010 since the active use of Lithium batteries. Being strict on regulations, In Europe, in total, at least 40 processing plants operate, which utilise up to 45% of all chemical power sources. Switzerland itself shows a good level of public awareness, but low collection rates. Japan requires batteries to have so far been stored in warehouses in compliance with safety requirements. In Australia, the highest percentage of recycling of batteries - the number of recycled batteries reaches 80%.

Methodology, Theoretical Orientation: Intersubjective studies have been conducted with in-depth research in the core damages from the used batteries; moreover, with analysis of recent regulations on corporate and public levels and observation of public awareness and contribution to the recycling waste.

Findings: Awareness on the governmental level is high all over the world, as well as the regulations, applied overproduction and recycling by the industries give rise to corporate responsibility. However, the level of awareness in the population for the need for separation of waste as well as the toxic effect on the environment and human lives is different from country to country.

Conclusion & Significance: As each state differ, a Household Hazardous battery waste needs to be addressed and successfully regulated individually towards the nation's approaches and needs.



Recent Publications

1. Vorotnikov, Vladislav. "Russia's Big Problem with Waste." Recycling and Waste World, 7 June 2018.
2. Kaushal, Rajendra Kumar, et al. Multi-Stakeholder Strategic Framework Interface for Portable Battery Waste Management. IAEME Publication,

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3. The Collection of Waste Portable Batteries in Europe in View of the Achievability of the Collection Targets Set by Batteries Directive 2006/66/EC. EPBAeurope.net/Perchards.com/SagisEPR.com, European Portable Battery Association (EPBA), 20 Aug. 2013,
4. Kattenburg, Kathy. "What Do Batteries Do to the Environment If Not Properly Recycled?" Education, 21 Nov. 2017,
5. The Museum of the Ilizarov Center Successfully Completes the Year of Ecology Russian Ilizarov Scientific Centre "Restorative Traumatology and Orthopaedics," 2017.

Biography

Sofya Khlebnikova is an inspired research-oriented International Relations student with a passion for improving human behaviour towards environmental conditions which affect the health of human beings in return. The evaluation of different countries' legislation, public awareness, and constructing possible plans for action looking at analysis of each solution are the main leading skills possessed that are successfully utilized in this work. With a lead and support of the respected Nadezhda BYCHKOVA, retired Head of the Department of Pedagogical Support and Rehabilitation of the Ministry of Education and Science of the Republic of Tatarstan in Russia, with the doctorate degree in atomic physics, Sofya was able to see the position of a policy-maker experienced in Russian Governmental Structure and provided with a scientific outlook on the issue. Nadezhda provides open-minded critics based on years of experience in research, teaching and administration both in educational institutions and federal governing body.

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Climate change: Myths, realities and prospects of a global deal to curb climate change

A W Jayawardena

The University of Hong Kong, Hong Kong

Climate change has been a hot topic during the past few years. Although scientific factors play a vital role in understanding climate change and implementing appropriate actions to reduce its impact, it is also marred by political and business related issues. The effort at the present time is to contain the global average temperature increase to within 1.5°C by the turn of the century. It is a fact that the earth system has been undergoing changes and will continue to change with time due to a number of factors. Climate change is one of them and there are discernible changes in some parts of the earth system as evidenced from melting of glaciers, abnormal weather etc. However, it is premature to conclude that it is a global phenomenon and that talking about a global average temperature has no conceptual meaning. The temperature on earth has temporal variations from about -50 to 50 spatially and temporally. There are also uncertainties associated with projections made into the future with data from a short window of observations. Two important factors that have not received their due attention in this context are that anthropogenic climate change which many climatologists associate with global warming depends upon the per capita consumption of energy and the world (or regional) population. No concrete action to reduce either of these has been taken on a global scale. The objective of this paper is to highlight the uncertainties associated with the science of climate change, the realities of the past, and the insurmountable problems associated with finding a global solution to a seemingly local or regional problem.

Recent Publications

1. Jayawardena, A. W. (2004): Flood and typhoon related disasters in South China, Proceedings, Tenth International Symposium on Natural and Human Induced Hazards and Third Workshop of the IUGG Commission on Geophysical Risk and Sustainability, Hazards 2004, December 2-4, 2004, National Geophysical Research Institute, Hyderabad, India, p. 64
2. Jayawardena A. W. (2006): Data driven approaches of real-time flood forecasting, Proceedings of Asia Oceania Geosciences Society 3rd Annual Meeting, AOGS 2006, 10-14 July 2006, Singapore (Abstracts in CD ROM; p. 182/1202).
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Biography

A. W. Jayawardena, a retired professor with over 40 years of experience in the fields of hydrology, water resources and environmental engineering in academia, government, consulting engineers and international organizations. He is a Chartered Engineer, a Fellow of the UK Institution of Civil Engineers, a Fellow of the Hong Kong Institution of Engineers and a Life Member of the American Society of Civil Engineers. At present, he is an Adjunct Professor in the Department of Civil Engineering of the University of Hong Kong (HKU) where he has been teaching for many years, and a Visiting Professor of the Department of Civil Engineering of Chu Hai College of Higher Education, Hong Kong, has in the past been a Technical Advisor to the Research and Development Centre of Nippon Koei Co. Ltd (Consulting Engineers), Japan, Research and Training Advisor to the International Centre for Water Hazard and Risk Management (ICHARM) under the auspices of UNESCO, Japan, and concurrently a Professor in the National Graduate Institute for Policy Studies (GRIPS), Japan, a Guest Professor of Beijing Normal University, China, a Visiting Professor of Hohai University, China, Honorary Professor in the Department of Statistics and Actuarial Sciences of the University of Hong Kong, a Visiting Professor in Tsinghua University of China, and an Adjunct Professor of Vellore Institute of Technology (VIT) in India.

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Climate change, its effects and possible solutions on our environment

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Climate change may refer to a change in the average weather condition or in the time variation of weather within the context of longer term average condition. Climate change is caused by factors such as biotic processes, variations in solar radiation, and other human activities that have been identified as primary causes of ongoing climate change, often referred to as global warming. There is no doubt that the impact of climate change are beginning to manifest on the entire globe and more particularly on the developing nations. Climate change and climate variability may pose serious challenge to national development. Government and other state agencies have adopted measures to minimize the impact of climate change due to its threat to global development and effort to end poverty. Without urgent action, climate impact could push an additional 100 million people into poverty by 2030. Climate change is a major issue that affect farmer's especially rural farmers within our communities. Farmer's already struggle to get a fair price for their goods, safe guard against weather and pest to stay in business. The impact of climate change is poised to make matters worse for young farmers. This is because there would be a low in production pattern due to higher temperature. This low production pattern as a result of climate change have negative consequences on our farmer's income. Environmental issues is one major issues caused by climate change. The impact of climate change has led to the various erosion caused either by human activities or natural disaster. Human activities such as sand winning and illegal mining has a negative consequence on our environmental landscape such as erosion. Natural environmental issues such as volcanic reaction also has negative impact on the environment. One other issue of climate change is economic issues. The economy is likely to setback if agricultural sector that contributes tremendously to the Gross Domestic Product is affected by climate change. This is possible because when there is a change in temperature and farmers yield declined, this decline have negative impact on the performance of the economy. Many communities will be force to move as they are exposed to rising sea levels, drought etc as a result of climate change impact. Communities are also susceptible to the health concern associated with climate change such as heat related ailment from higher temperature, malnourishment due to increase strain of food. Climate change has the effect of changing the habitat of wildlife from their natural location and more especially hunting wildlife illegally. The issue of illegal hunting of wildlife has a negative effect on the environment. This is because the setting of bush fires to trace wildfire degrade the environment which causes excessive heat temperature leading to global warming. The increasing use of traditional crude to power our thermal plants has the effects of depleting the ozone layers which give rise to global warming which eventually leads to variability in the environment. So the effects of climate change has an adverse effects on the environment, economy and the health of people. To this end, a number of measures needs to be considered to revert the adverse effects of climate change and global warming, In addition, industries and factories should also find alternative source of energy in powering their thermal. If the use of traditional crude is to be used, they should not go beyond certain level as a way of reducing the effects on climate change. Moreover, thermal plants and vehicles should be manufactured to use other sources of energy rather than our traditional crude due to its effects on the environment. Also, countries can sign a memorandum of understanding on the level of crude to use within a country in a year, so that countries under the agreement would not go beyond the agreed use of crude as a convenient way of reducing the effects of climate change. If any countries go beyond the agreed use of crude, sanctions should be impose and a fine paid. In effects, these are the effects of climate change and its possible solutions to reduce the effects to ensure environmental and health sustainability.

Biography

Yakubu Muntaka Musah is my name, MBA, BBA. I completed my Bachelor Degree at University of professional studies, Accra in August 2013 with distinction, subsequently had my Masters degree in oil and gas at the same University. Few years after my completion, I engaged in many academic activities including attending a Bio plastic conference in 2017, in Paris, France and gave an oral presentation, to which I was awarded the Student Ambassador for the conference. My vision is to see the environment green, hence my award as the student facilitator in the just ended Biofuel conference in Edinburg, Scotland.