



Research Notes Letter

*Research & Innovation for a sustainable
Baltic Sea Region*

Volume 4, Issue 2, 2021

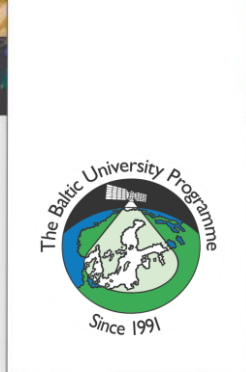
Recent Research from
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This issue of the Research Notes Letter contains 16 scientific abstracts on current research conducted at the BUP Participating Universities. The common denominator is the interest in a more sustainable development of the Baltic Sea Region. We want the Research Notes Letter to reflect the multi- and interdisciplinary science we believe is central to meet the Sustainable Development Goals indicated by the United Nations 2030 Agenda for Sustainable Development. All previous issues of the Research Notes Letter are possible to download from the web site.

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The Research Notes Letter in short

We publish the Research Notes Letter three times per year and disseminate it in the network. The Research Notes Letter highlights abstracts on recent publications relating to the Baltic Sea Region and our ten BUP Themes. We promote research from our Participating Universities. The abstracts presented in the Research Notes Letter are accompanied by information on authors, information on their affiliation, abstracts, keywords, and citation.

Editor,

Ulrika Jansson Klintberg

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Implementation challenges for seafarers' social security protection: The case of the European Union

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Affiliation: 1) World Maritime University, Malmo, Sweden,

Type of publication: Article peer review



Abstract:

This article arises out of findings published in the Study on *Social Aspects in the Maritime Transport Sector*, funded by the European Commission' Directorate-General for Mobility and Transport (DG MOVE) and prepared by a consortium including Coffee International Development, Consultores em Transportes Inovação e Sistemas, Oxford Research, and the World Maritime University. That report was published on the DG MOVE's website on 3 July 2020. This research has also benefitted from funding provided by the Nippon Foundation. The usual disclaimer applies.

Citation:

Carballo Piñeiro, L., (2020). Implementation challenges for seafarers' social security protection: The case of the European Union. *International Social Security Review*, Volume 73, (Issue 4) Pages 3-24, <https://onlinelibrary.wiley.com/doi/full/10.1111/issr.12248>

Ship first: Seafarers' adjustment of records on work and rest hours

Authors: Raphael Baumler¹, Bikram Singh Bhatia¹, Momoko Kitada¹

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Type of publication: Article peer review



Abstract:

The article explores the recordkeeping practices of seafarers concerning the implementation of work and rest hours? regulations. In particular, it considers what motivates seafarers to hide their violations through record adjustment. The research adopted a qualitative research methodology to understand this industry problem, involving the use of semi-structured interviews. These were conducted with 20 seafarers to analyze their recording practices and adjustment of records. The participants underline that the imbalance between workload and manning levels leads to recurrent violations, particularly during port-related operations and for seafarers on the 6On/6Off watch system. To hide their violation and feign compliance, the data revealed that almost all seafarers in our study adjusted work and rest hours? records. The fear of the consequences of non-conformities during third party inspections is the main driver for such adjustment of records. Employment concerns and job insecurity tend to make seafarers submissive to the companies? interests, and they place the ship interests first. Flag State, Port State, and shipping companies seem to disregard violations and adjustments. Therefore, adjusting records seems a low-risk option for seafarers. However, systematic adjustment of records points to failures of the International Safety Management (ISM) Code and its audit system. In many cases, seafarers accept unfavorable work conditions and embrace the ethos of 'ship first'.

Citation:

Baumler, R., Singh Bhatia,B., & Kitada, M., (2020). Ship first: Seafarers' adjustment of records on work and rest hours, *Marine Policy*, <https://doi.org/10.1016/j.marpol.2020.104186>

Strategies for Sustainable and Circular Management of Phosphorus in the Baltic Sea Region: The Holistic Approach of the InPhos Project

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Type of publication: Article peer review



Abstract:

Despite the significant reduction of phosphorus (P) discharge in the Baltic Sea in the last decades, obtained through the implementation of some approaches within the Helsinki Convention, eutrophication is still considered the biggest problem for the Baltic Sea environment. Consequently, the reduction of P load is an urgent need to solve, but the complexity of both the environmental and legislative context of the area makes this process difficult (more than in the past). Eutrophication is an intricate issue requiring a proper framework of governance that is not easy to determine in the Baltic Sea Region where the needs of several different countries converge. To identify the most suitable strategy to reduce the eutrophication in the Baltic Sea, the InPhos project (no. 17022, 2018-2019, funded by the European Institute of Innovation and Technology (EIT) Raw Materials) adopted a holistic approach considering technical, political, economic, environmental and social aspects about P management. With the aims to raise the awareness about the P challenge, foster the dialogue among all the stakeholders, and find solutions already developed in other countries (such as Germany and Switzerland) to be transferred in the Baltic Sea Region, the InPhos project

consortium applied the methodology proposed in this paper, consisting of three main phases: (i) analysis of the available technologies to remove P from waste streams that contribute to eutrophication; (ii) analysis of the main streams involving P in Baltic Sea countries to highlight the potential of more sustainable and circular P management; (iii) study of the current context (e.g., already-existing initiatives and issues). This approach allowed to identify four categories of recommendations and practical actions, proposed to improve P management in the Baltic Sea region. During the project, the consortium mainly addressed social aspects. Following steps beyond the project will be more quantitative to determine the techno-economic feasibility of circular P management in selected demo cases in the region.

Citation:

Bianchini, A. et al. (2020). Strategies for Sustainable and Circular Management of Phosphorus in the Baltic Sea Region: The Holistic Approach of the InPhos Project. *Sustainability*. 12(6), 2567; <https://doi.org/10.3390/su12062567>

Narrow pasts and futures: how frames of sustainability transformation limit societal change

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Affiliation: 1) Umeå University, Umeå, Sweden

Type of publication: Article peer review



Abstract

Two frames dominate present-day interpretations of sustainability and approaches to sustainability transformation in national and global policy arenas. One frame relates to transformation in global environmental governance that promotes goal-oriented agendas. The other frame relates to earth system sciences where sustainability transformation means breaking the devastating trends of the Anthropocene. In this paper, we examine the historical and cultural underpinnings of these two frames, each invoking particular relations and approaches to sustainability transformation. Our contribution is to discuss the role of the past in these frames and to illuminate how current outlooks toward the future still rely on principles that emerged in eighteenth- and nineteenth-century Europe and thus hinder alternative approaches to transformation in the present.

Citation:

Priebe, J., Mårald, E. & Nordin, A. (2021). Narrow pasts and futures: how frames of sustainability transformation limit societal change. *Journal of Environmental Studies and Sciences*, 11, 76–84. <https://doi.org/10.1007/s13412-020-00636-3>

Building communities in times of crisis - Impacts of the COVID-19 pandemic on the work of transition intermediaries in the energy sector

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Affiliation: 1) Lund University, Lund, Sweden, 2) University of Copenhagen, Copenhagen, Denmark

Type of publication: Article peer review



Abstract

The ongoing COVID-19 pandemic affects people worldwide. The policies in response to the virus range from closure of national borders to curfews for entire metropolises, like Paris. While we can expect severe impacts on the world economy, the consequences of the pandemic for local sustainability transitions are entirely unclear. In this exploratory study, we investigate how the current situation affects the work of transition intermediaries in the energy sector. More concretely, we aim to analyse the impact of COVID-19 policies on community energy projects and the subsequent change of work practices of intermediaries in this situation. Our data consists of qualitative data we collected between January and October 2020. Our results show that transition intermediaries are affected in different ways. Most notably, the work on networking suffers during these times of crisis. We found that intermediaries are particularly challenged in their ability to build trust. This particularly affects new and complex community energy projects and intermediation activities needed for systemic change. We found that established projects with a strong trust base are least affected by these limitations. Intermediaries dependent on private funding face much bigger problems than publically funded organisations. Our results offer some novel and relevant insights in the role and work of transition intermediaries and the development of community energy projects in times of crisis. These findings can help governments, intermediary organizations and citizen groups to design future transition processes in ways that are more resilient to external shocks.

Citation:

Busch, H., & Hansen, T., (2021). Building communities in times of crisis - Impacts of the COVID-19 pandemic on the work of transition intermediaries in the energy sector. *Energy Research & Social Science*, Volume 75, 102020, <https://doi.org/10.1016/j.erss.2021.102020>.

Stakeholder collaboration models for public transport procurement of electric bus systems OA

Authors: Sven Borén¹ and Anders Grauers²

Affiliation: 1) Blekinge Institute of Technology, Karlskrona, Sweden 2) Chalmers University of Technology, Gothenburg, Sweden

Type of publication: Article peer review



Abstract

Earlier studies have mainly focused on technology, economy and advantages of electric buses, and they have largely shown that electric buses could be one of the solutions for sustainable public transport. Despite this, the present procurement process for public transport in Sweden is not suitable for including support systems for electric buses. This study was aimed to find a stakeholder collaboration model that would allow electric bus systems to be more effectively included in the procurement process for public transport. The results were achieved by several multi-stakeholder collaboration seminars and meetings that included representatives from regional public transport authorities, bus operators, bus manufacturers, energy companies, municipalities, and experts involved in bus transport. The study primarily developed two stakeholder collaboration models, suggesting that charging infrastructure should be designed separately from the common procurement process. In these models, energy companies, electric grid owners, charging infrastructure operators, regional public transport authorities, and municipalities need to collaborate. The first model is designed for a system that includes chargers at certain locations along a route and/or stakeholders with a low level of experience of electric bus systems, while the second is designed for a system that includes bus charging at the depot and/or stakeholders with a high level of experience of electric bus systems.

Citation

Borén, S. and Grauers, A. (2019). Stakeholder collaboration models for public transport procurement of electric bus systems. *The International Journal of Sustainability Policy and Practice* 15 (1): 19-29. DOI: 10.18848/2325-1166/CGP/v15i01/19-29

Impact of Nitrogen Fertigation on Watermelon Yield Grown on the Very Light Soil in Poland OA

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Affiliation: 1) UTP University of Science and Technology, Bydgoszcz, Poland 2) University of Agriculture, Krakow, Poland 3) Warsaw University of Life Sciences, Poland 4) University of Minnesota, St. Paul, MN, USA

Type of publication: Article peer review



Abstract

The effect of nitrogen fertigation of two watermelon cultivars grown on the very light soil in the central part of Poland, during 2012–2014, was evaluated. The field experimental design was a split-plot with four replications. The main plot was the drip fertigation with nitrogen applied in two combinations: drip irrigation + broadcasted nitrogen fertilization (DI) used as a control, and drip irrigation + fertigation with nitrogen (DF); where, two cultivars: Bingo and Sugar Baby were used as a split-plot. The phosphorus and potassium fertilizers were applied pre plant in the spring, whereas, three rates of 40 kg ha⁻¹ of nitrogen fertilizer were applied during the growing season. The fertigation was performed using a proportional mixing dispenser. The ripened fruits were harvested progressively as they mature. The marketable fruit yield, the single fruit weight and the number of fruits per plant, were evaluated. Tested factors presented a significant effect in the yield characteristics, further the interaction among the factors was important. DF, comparing to DI, notably improved fruit traits. Bingo cultivar had higher yield than Sugar Baby, but Sugar Baby cultivar produced more fruits than the Bingo under the DF treatment. This study provides the evidence that on a very light soil with low water and nutrients retention capacity the performance of watermelon can be optimized when nitrogen is applied directly through drip irrigation.

Citation

Rolbiecki, R., Rolbiecki, S., Piszczek, P., Figas, A., Jagosz, B., Ptach, W., Prus, P. and Kazula, M.J. (2020). Impact of Nitrogen Fertigation on Watermelon Yield Grown on the Very Light Soil in Poland. *Agronomy* 2020, 10, 213. DOI 10.3390/agronomy10020213

The role of artificial intelligence in achieving the Sustainable Development Goals

Authors: Ricardo Vinuesa¹, Hossein Azizpour¹, Iolanda Leite¹, Madeline Balaam¹, Virginia Dignum², Sami Domisch³, Anna Felländer⁴, Simone Daniela Langhans⁵, Max Tegmark⁶ & Francesco Fuso Nerini¹

Affiliation: 1) KTH Royal Institute of Technology, Stockholm in Sweden, 2) Umeå University, Umeå in Sweden, 3) Leibniz-Institute of Freshwater Ecology and Inland Fisheries, Berlin in Germany, 4) AI Sustainability Center, Stockholm in Sweden, 5) Basque Centre for Climate Change (BC3), Leioa in Sweden, 6) Massachusetts Institute of Technology, Cambridge in USA

Type of publication: Article Peer Review



Abstract:

The emergence of artificial intelligence (AI) and its progressively wider impact on many sectors requires an assessment of its effect on the achievement of the Sustainable Development Goals. Using a consensus-based expert elicitation process, we find that AI can enable the accomplishment of 134 targets across all the goals, but it may also inhibit 59 targets. However, current research foci overlook important aspects. The fast development of AI needs to be supported by the necessary regulatory insight and oversight for AI-based technologies to enable sustainable development. Failure to do so could result in gaps in transparency, safety, and ethical standards.

Citation:

Vinuesa, R., Azizpour, H., Leite, I. *et al.* (2020) The role of artificial intelligence in achieving the Sustainable Development Goals. *Nature Communications* 11, 233 (2020). <https://doi.org/10.1038/s41467-019-14108-y>

Assessment of local genetic structure and connectivity of the common eelgrass (*Zostera marina*) for seagrass restoration in northern Europe

Authors: Johan Hollander¹, Lourdes Martínez-García^{2,3}, Bengt Hansson²,

Affiliation: 1) World Maritime University, Malmö in Sweden, 2) Lund University, Lund in Sweden, 3) University of Oslo, Oslo in Norway

Type of publication: Article peer review



Abstract:

Seagrass meadows are one of the most important habitats in coastal regions since they constitute a multifunctional ecosystem providing high productivity and biodiversity. They play a key role in carbon sequestration capacity, mitigation against coastal erosion, and nursery grounds for many marine fish and invertebrates. However, despite these ecosystem functions and services, seagrass meadows are a threatened ecosystem worldwide. In the Baltic Sea, seagrass meadows have declined rapidly mainly because of eutrophication, anthropogenic activities and climate change. This decline has the potential to erode the genetic variation and genetic structure of the species. In this study, we assessed how genetic variation and genetic differentiation vary among *Zostera marina* meadows and with a number of environmental characteristics in the county of Scania in southern Sweden. A total of 205 individuals sampled at 12 locations were analysed with 10 polymorphic microsatellite loci. Results showed that in spite of anthropogenic impacts and climate change pressures, locations of *Z. marina* possess high genetic variation and weak genetic differentiation, with three major genetic clusters. Long-distance dispersal and/or stepping stone dispersal was found among locations, with higher migration rates within the west coast. Organic matter, salinity and maximum depth appeared to be factors most strongly associated with the genetic structure and morphological variation of *Z. marina*. These findings contribute significantly in the identification of potential donor sites and the viability of impacted areas to recover from natural recruitment, for the development of effective transplantation measures of *Z. marina* in the southern Baltic Sea and temperate regions elsewhere.

Citation:

Martínez-García L, Hansson B, Hollander J (2021). Assessment of local genetic structure and connectivity of the common eelgrass ‘*Zostera marina*’ for seagrass restoration in northern Europe. *Marine Ecology Progress Series*. 664:103-116. <https://doi.org/10.3354/meps13658>

Current overview of the Role of “Water in Biomechanical and Related Systems”

Authors: Adam Gadomski¹ (ed)

Affiliation: 1) UTP University of Science and Technology, Bydgoszcz in Poland

Type of publication: Book

This book contains a survey of sixteen versatile studies on water as it is seen in different contexts, pertinent to selected biomechanical and related systems. The contexts basically involve three types of distance (also, force/pressure and/or energy) scales, ranging from a microscopic scale, then passing over a mesoscopic (or, intermediate) scale, to ultimately arrive at their macroscopic counterpart.

Water itself is a hot subject of permanent debate on its molecular, aggregation and phase-transition involving properties, etc. It is also a medium that expresses many colligative as well as synergistic properties such as those contributing to facilitated lubrication (and/or adhesion) of articulating devices, especially on supramolecular level of biomatter organization.

The contributions collected by the edited book have included:

- (i) General discussions about: sense and nonsense about water (a critical and knowledge-refreshing study); and water nanoclusters in cosmology, astrobiology, the RNA world and biomedicine? a future-prospect study.
- (ii) Microscopic scale involving considerations as regarding: solvent induced effects on protein folding; protein intramolecular and solvent bonding in a major sonovital fluid component; water behavior near the lipid bilayer; and water molecules organization surrounding ions, amphiphilic protein (viz hyaluronan) residues.
- (iii) Mesoscopic scale addressing studies on: pathological water science (a critical and experiment based study); a powdery mildew fungus turning oak leaf surface to the highly hydrophobic state (toward superhydrophobicity); physics and/or biomimetics of suction cups in air and in water; water transport through synthetic membranes as a biomimetic inspiration coming from biological membranes; and travelling waves connected to blood (having an appreciable content of water) flow and motion of arterial walls.
- (iv) Macroscopic scale unravelling case studies on: fractal properties of flocs, filtration cakes and biofilms in water and wastewater treatment processes; soil hydrology; pollution and patterns of water stock; and water on livestock, thus ecological issues. (The two latter studies seem to suit partly for decision- and policy-makers; of course ecologists can be invited for it too.)

The collection of (i)-(iv) determines a real space for looking at scaling properties of the water containing biosystems. The present monograph is found it useful and practical as it has been illustrated as well as argued by a current overview contained in it. This overview (chapter 1) gives in a concise way an insight into the subject matter of the monograph. To put the main thought in short: Water is both readily percolating and predictably interacting agent. At a molecular level it is a dipole, whereas at the supramolecular counterpart it takes preferentially on a tetrahedral form. It interacts with biosurfaces, and accommodates its adhesive layer to be structured viz ordered. It flows readily and quite predictably, being accepted as a Newtonian fluid. Water molecules and their clusters as well as volumetric contributions (at the macroscale) undergo principal dynamics? laws: such as that of Newton (at macroscale), the one by Coulomb, contributing preferentially to the electrostatic interactions, as well as that of (attractive and quantum-mechanics touching) London-Van der Waals interaction set.

It is worth unveiling that the monograph as a whole is intended to help find physical scale (or, distance vs. force/pressure and energy) dependent solutions that will be capable of transferring the detailed knowledge accumulated about the subject of the role of water for biosystems, biomechanics and the related (percolation addressing) issues into biotechnologically efficient and biomimetically well-posed solutions for the future.

Citation:

Gadomski, A. (ed.), (2021). *Water in Biomechanical and Related Systems*. Springer Nature.
Link: <https://www.springer.com/gp/book/9783030672263>

Green Infrastructure Implementation Programmes at National Level: Case Study “National Project – Support of Biodiversity with Green Infrastructure Elements in Municipalities of Slovakia”

Authors: Denisa Halajová¹, Peter Halaj¹

Affiliation: 1) Slovak University of Agriculture in Nitra, Nitra in Slovakia

Type of publication: Article peer review

Abstract: EU-wide strategy promotes the deployment of green infrastructure across Europe. Integrating green infrastructure in spatial planning, policy and strategy development at regional/national levels is the task of each EU member state. The aim of this article is to give an example and evaluate one of the ongoing projects at national level, namely National project – Support of Biodiversity with Green Infrastructure Elements in Municipalities of Slovakia “Green municipalities of Slovakia“. The aim of the national project is to implement green infrastructure at local level through vegetation elements in order to maintain and restore biodiversity and ecosystems outside of protected areas Natura 2000. The programme supporting tree planting in rural municipalities is an important tool for the creation of basic elements of green infrastructure throughout Slovakia. As part of the national program, an implementation plan for 6 municipalities in Slovakia in 2020 is proposed. Subsequently, the implementation projects in terms of the use of vegetation in different categories of green spaces, types of vegetation, representation of tree species, including costs and benefits, are proposed. Based on the results, the potential and limits of the programme and specific suggestions for its further use are set. In 6 municipalities, a total of 17 suitable localities were selected for the project, which is an average of 2.83 localities per municipality. A total of 467 woody plants individuals were proposed, representing a total of 19 woody plants species. The total cost of planting is an average of €12,601.10 per municipality, €7,312.05 per ha of area, and €161.90 per single tree. The average number of trees per ha is 45.15 individuals and per each municipality it is 77.83 trees. In the conclusions, a potential risk of the programme regarding the subsequent maintenance of trees, which is not funded under the program, is highlighted.

Citation:

Halajová, D., & Halaj, P. (2020). Green Infrastructure Implementation Programmes at National Level: Case Study “National Project–Support of Biodiversity with Green Infrastructure Elements in Municipalities of Slovakia”. *Acta Horticulturae et Regiotecturae*, 23(2), 66-70. DOI: <https://doi.org/10.2478/ahr-2020-0014>

Isolation and Identification of Lactic Acid Bacteria in Wine Production by MALDI-TOF MS Biotyper

Authors: Miroslava Kačániová^{1,2}, Simona Kunová¹, Jozef Sabo¹, Eva Ivanišová¹, Jana Žiarovská¹, Soňa Felšöciová¹, Katarína Fatrcová-Šramková¹, and Margarita Terentjeva³

Affiliation: 1) Slovak University of Agriculture in Nitra, Nitra in Slovakia, 2) University of Rzeszow, Rzeszow in Poland, 3) Latvia University of Life Sciences and Technologies, Jelgava in Latvia

Type of publication: Article peer review

Abstract:

The aim of this study was to identify lactic acid bacteria (LAB) in grapes, must and wines. A total amount of 90 samples including grape (n = 30), must (no = 30) and wine (no = 30) were collected from vineyards in Slovakia. LAB were used cultured on MRS agar with subsequent confirmation with MALDI-TOF mass spectrometry (Bruker Daltonics). Altogether, 904 isolates were identified. Members of the family Lactobacillaceae were the most abundant in grape (60%), must (46%) and wine (51%). *Lactobacillus*, *Lactococcus*, *Leuconostoc*, *Pediococcus* and *Weissella* genera and 27 species of LAB were isolated from the examined samples. *Leuconostoc mesenteroides* spp. *mesenteroides* was the most abundant species in grape, must and wine.

Citation:

Kačániová, M., Kunová, S., Sabo, J., Ivanišová, E., Žiarovská, J., Felšöciová, S., & Terentjeva, M. (2020). Isolation and identification of lactic acid bacteria in wine production by MALDI-TOF MS biotyper. *Acta Horticulturae et Regiotecturae*, 23(1), 21-24. DOI: <https://doi.org/10.2478/ahr-2020-0006>

Developing Sustainability Competences Through Pedagogical Approaches: Experiences from International Case Studies

Authors: Rodrigo Lozano¹, Maria Barreiro-Gen¹

Affiliation: 1) University of Gävle, Gävle in Sweden

Type of publication: Book chapter

Abstract:

Higher Education Institutions have been major agents of social change. In this context, they have been major drivers of sustainable development and sustainability. Educators are at the centre of curriculum renewal and making it more sustainability oriented, and they need to ensure that they develop their students' sustainability competences. Several tools have been developed, or modified, to assess sustainability in universities. One of the few tools focusing specifically on curricula is the "Sustainability Tool for Assessing Universities' Curricula Holistically" (STAUNCH®). In parallel, one of the most recent developments in Higher Education for Sustainable Development discourses has been on developing competences and linking them to the use of pedagogical approaches. In spite of this, there have been limited efforts connecting pedagogical approaches and competences. The book integrates practice-based original research on how sustainability is incorporated in curricula, the competences being developed, and the pedagogical approaches being used to develop the competences in 15 Higher Education Institutions case studies from 12 countries in 4 continents (Africa, America, Australia, and Europe). The book provides unique insights into sustainability issues being taught, the ranking of competences and pedagogical approaches, and how these two relate to each other.

Citation:

Lozano R., Barreiro-Gen M. (2021) Introduction. In: Lozano R., Barreiro-Gen M. (eds) *Developing Sustainability Competences Through Pedagogical Approaches. Strategies for Sustainability*. Springer, Cham. https://doi.org/10.1007/978-3-030-64965-4_1

Change in Temperature Conditions of Slovakia to the Reference Period 1961-2010 and their Expected Changes to Time Horizons Years 2035, 2050, 2075 and 2100 under the Conditions of Changing Climate

Authors: Ján Čimo¹, Karol Šinka¹, Beata Novotná¹, Andrej Tárník¹, Elena Aydin¹, Lucia Toková¹, Vladimír Kišš¹, Tatijana Kotuš¹

Affiliation: 1) Slovak University of Agriculture in Nitra, Slovakia

Type of publication: Article peer review

Abstract:

The purpose of the paper was to show cognition from the theory of climate change. The map outputs of these changes offer the climate data from basic elements and characteristics of the energy balance in terms of the current state as well as the trends and assumptions of their future changes in Slovakia. For these agroclimatic analyses, 100 climatic stations in Slovakia spread out to cover all agricultural regions, up to 800 m above sea level, have been selected. Our analyses are related to the period of years 1961–2010, when measurements and observations were the most homogeneous. The future trends and map outputs of future climate change were determined with the mathematic-statistical methods to the 2035, 2050, 2075- and 2100-year horizons. This study presents the impact of the climate change on the temperature conditions in Slovakia. The temperature changes (average, maximum and minimum temperature) were analysed with forecasts up to year 2100. The forecasts for the 2100-year horizon indicate increasing of the average annual temperature on average by about 2.0°C, maximum temperature on average by about 2.0°C and minimum temperature on average by about 2.5–3°C in comparison to the present.

Citation:

Čimo, J., Šinka, K., Novotná, B., Tárník, A., Aydin, E., Toková, L., Kišš, V., and Kotuš, T. (2020). Change in Temperature Conditions of Slovakia to the Reference Period 1961-2010 and their Expected Changes to Time Horizons Years 2035, 2050, 2075 and 2100 under the Conditions of Changing Climate. *Journal of Ecological Engineering*, 21(7), pp.232-240. <https://doi.org/10.12911/22998993/125585>

The ghost nets phenomena from the chemical perspective

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Type of publication: Conference paper

Abstract:

The XXIst century might be called the Plastic Era. With the continually growing consumption and production, low recycling level, one observes the continuous transformation of the Blue Planet into the Ocean of Plastics. Among various problems related to the presence of synthetic materials in the environment, the ghost nets draw particular attention. They are present in the global ocean due to lost or abandoned fishing gear. Their impact on the environment is represented by the tones of animals caught. Moreover, they are an abundant source of secondary marine microplastic and release a considerable amount of toxic chemical compounds. To resolve this issue, an interdisciplinary approach is needed. Chemical research enables a better understanding of polymer behavior and their weathering, whereas spectroscopy helps in qualitative analyses and proposes solutions. This paper aims to present the interdisciplinary study of this phenomenon and its broad context, including social awareness but underlines the crucial role of chemical research. One focuses on the basic studies of chemical and physical properties as this knowledge provides the first and essential step to tackle the problem.

Citation:

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A framework for the implementation of the Sustainable Development Goals in university programmes

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Type of publication: Article peer review

Abstract:

There is a perceived need to develop approaches, methods and tools that may help higher education institutions to systematically introduce the Sustainable Development Goals (SDGs) into research and teaching as an intrinsic part of their programs. However, at present, there is a gap in the literature on the suitable means to do so. This paper addresses this gap by examining the many foci and commitments for and about the SDGs that are currently included in university programs. An overview of the SDGs' focus at universities was presented using a survey to gather qualitative and quantitative data. . Based on current trends and gaps, this paper identifies the need for a framework which may be of assistance in facilitating the inclusion of the SDGs as a whole, and individually targets in particular in the programs of institutions of higher education. The scientific contribution of this paper value lies in the fact that this is one of the first papers to tackle the need for a framework which caters to a more systematic introduction of the SDGs in university programs. The basis for the framework approach, here introduced, includes institutional, thematic, structural and personal/individual aspects which need to be considered for proper implementation of the SDGs at the university level.

Citation:

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