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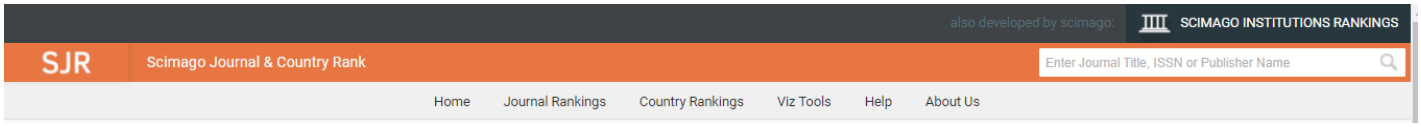

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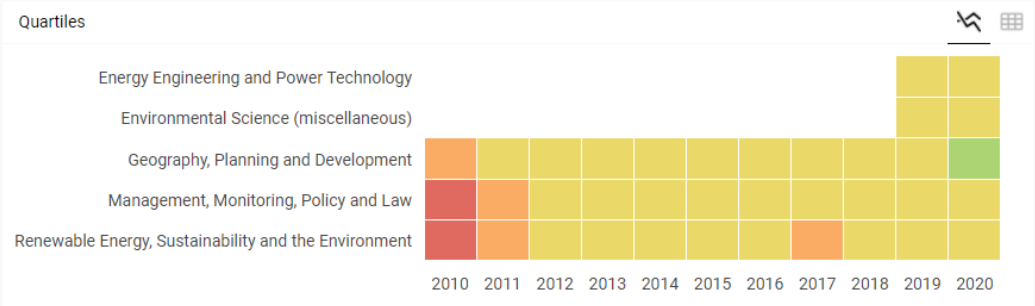
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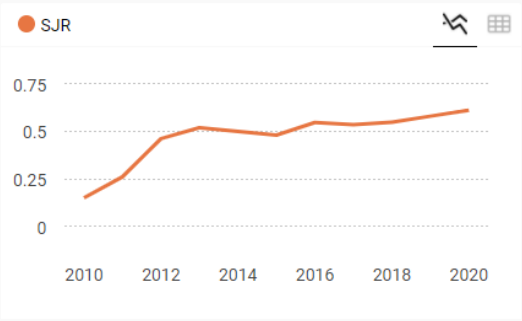

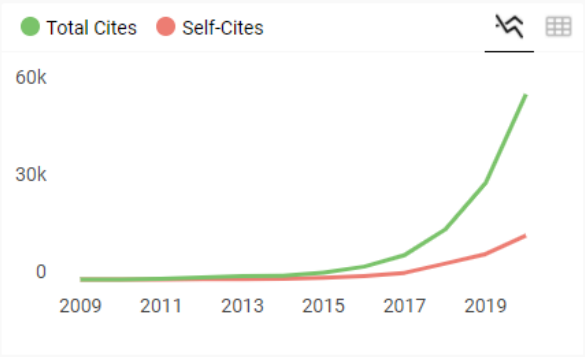

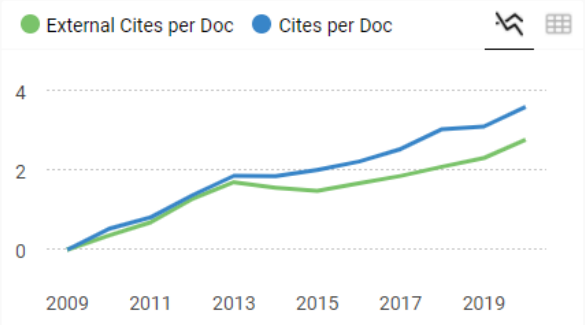

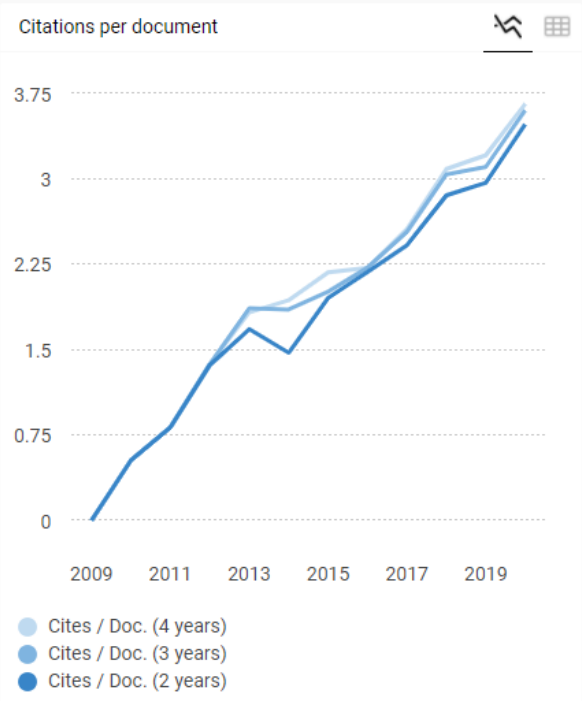

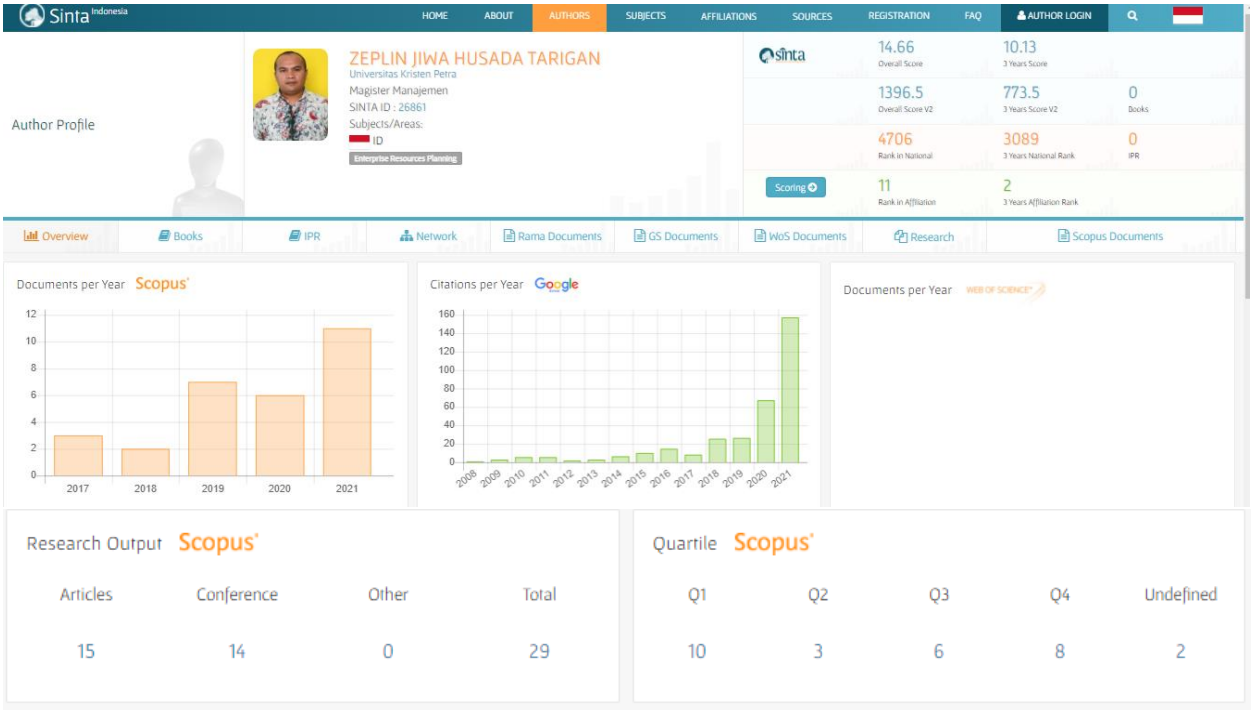

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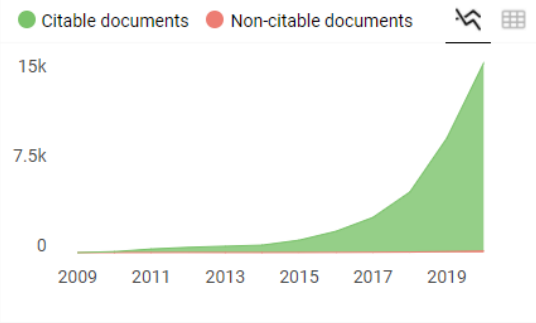

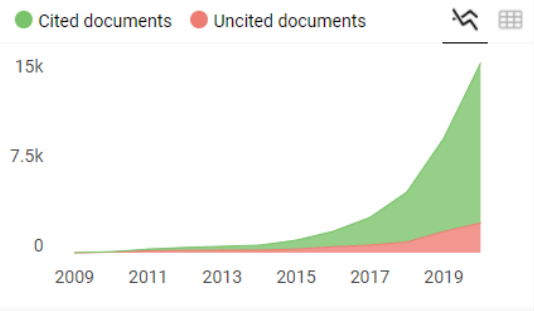

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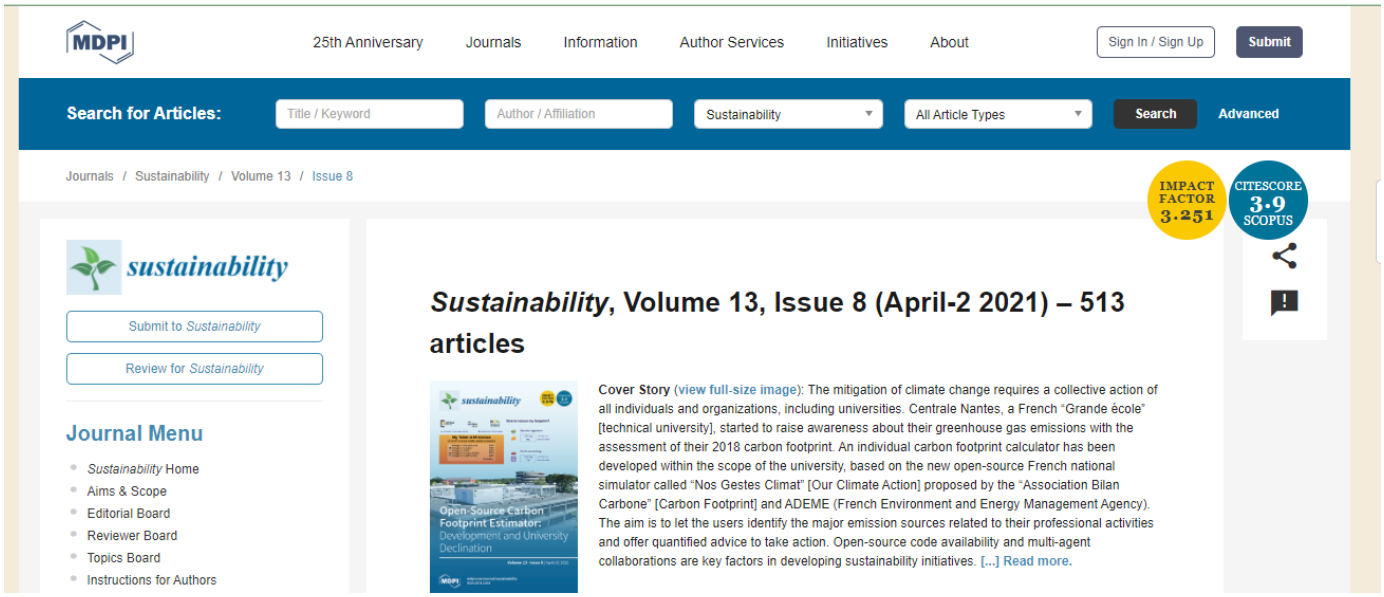

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Sustainability **2021**, *13*(8), 4594; **https://doi.org/10.3390/su13084594** - 20 Apr 2021

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Abstract Essential oils were proposed as natural additives to ensure food safety and quality in a more sustainable approach. The chemical composition of *Thymus vulgaris* essential oil (TV-EO) collected from Morocco, its antioxidant and antimicrobial activity against different serotypes of *Salmonella enterica* subsp. *enterica* [...] Read more.

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Abstract Modern agricultural technology management is nowadays crucial in terms of the economy and the global market, while food safety, quality control, and environmentally friendly practices should not be neglected. This review aims to give perspectives on applying big data analytic and modern technologies [...] Read more.
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by Fabio Bothner
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Sustainability **2021**, *13*(8), 4591; **https://doi.org/10.3390/su13084591** - 20 Apr 2021
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Sustainability **2021**, *13*(8), 4590; **https://doi.org/10.3390/su13084590** - 20 Apr 2021
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Abstract *Nesterenkonia* sp. PF2B19, a psychrophile was isolated from 44,800-year-old permafrost soil. This is the first report on comparative genomics of *Nesterenkonia* sp. isolated from Arctic. Genome of PF2B19 exhibited the presence of a vast array of genetic determinants involved in cold adaptation i.e., [...] Read more.
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Abstract This paper aims to present a systematic literature review on state-of-the-art Educational Escape Rooms (EERs) with the use of digital technologies. More specifically, the focus of the study is to present the current developments and trends concerning Digital Educational Escape Rooms (DEERs) and [...] Read more.
(This article belongs to the Special Issue Smart Educational Games and *Gamification* Systems in Online Learning Environments)

Open Access Article

Continuance Intention of University Students and Online Learning during the COVID-19 Pandemic: A Modified Expectation Confirmation Model Perspective

by Ting Wang, Chien-Liang Lin and Yu-Sheng Su
Sustainability **2021**, *13*(8), 4586; **https://doi.org/10.3390/su13084586** - 20 Apr 2021
Cited by 5 | Viewed by 1011

Abstract The prevalence of COVID-19 has changed traditional teaching modes. For many teachers, online compensated for the absence of traditional face-to-face instruction. Online learning can support students and schools and can create unique opportunities under emergency management. Educational institutions in various countries [...] Read more.
(This article belongs to the Special Issue Effects of COVID 19 for Sustainable Education, Systems and Institutions)

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Effect of Temperature on Internal Shear Strength Mechanism of Needle-Punched GCL

by Yang Yang, Jianyong Shi and Xuede Qian
Sustainability **2021**, *13*(8), 4585; **https://doi.org/10.3390/su13084585** - 20 Apr 2021
Viewed by 437

Abstract Needle-punched geosynthetic clay liner (NPGCL) has been widely used in landfills. The internal strength of the GCL changes with temperature variation, which affects its application in landfills. A large-scale temperature-controlled direct shear apparatus was developed to study the internal shear strength characteristics of [...] Read more.

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An Exploratory Study on Optimal Iterative Design Schedules with the Consideration of Design Quality and Resource Constraints

by Sou-Sen Leu, Theresia Daisy Nattali Suparman and Cathy Chang-Wei Hung
Sustainability **2021**, *13*(8), 4584; **https://doi.org/10.3390/su13084584** - 20 Apr 2021
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Abstract The classical dependency structure matrix (DSM) can effectively deal with iterative schedules tha and interdependent, such as the design process and the concurrent process. Classical DSM generally follows the assumption that the least iteration occurs to achieve the shortest completion [...] Read more.
(This article belongs to the Special Issue Project Intelligence and Management)

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Propensity to Choose Electric Vehicles in Cross-Border Alpine Regions

by Silvia Tomasi, Alyona Zubaryeva, Cesare Pizzirani, Margherita Dal Col and Jessica Balest
Sustainability **2021**, *13*(8), 4583; **https://doi.org/10.3390/su13084583** - 20 Apr 2021
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Abstract Electric vehicles (EVs) are low-carbon innovations that decrease emissions in transportation. Understanding what drives individual propensity to choose EVs supports policymakers in shaping effective low-carbon mobility policies. Within the MOBSTER Interreg project, data were collected using a survey administered to residents in three [...] Read more.
(This article belongs to the Collection Sustainable Transport Economics, Behaviour and Policy)

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Diversity Bears Fruit: Evaluating the Economic Potential of Undervalued Fruits for an Agroecological Restoration Approach in the Peruvian Amazon

by Elisabeth Lagneaux, Merel Jansen, Julia Quaedvlieg, Pieter A. Zuidema, Niels P. R. Anten, Mishari Rolando García Roca, Ronald Corvera-Gomringer and Chris J. Kettle
Sustainability **2021**, *13*(8), 4582; **https://doi.org/10.3390/su13084582** - 20 Apr 2021
Cited by 1 | Viewed by 862

Abstract Agroforestry systems with a range of native and often neglected and underutilized tree species (N
recognized for their potential role in restoration, simultaneously providing ecological and livelihood benefits
of these systems requires knowledge about beneficial species, system-level potential profitability, [...] Read
(This article belongs to the Special Issue Agrobiodiversity and Sustainable Production on Agricultural

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Taxation for a Circular Economy: New Instruments, Reforms, and Architectural Changes in the Fiscal System

by Xavier Vence and Sugey de Jesus López Pérez
Sustainability **2021**, *13*(8), 4581; **https://doi.org/10.3390/su13084581** - 20 Apr 2021
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Abstract This article addresses fiscal policy as a key instrument for promoting the transition to a circular economy. It is based on the hypotheses that (1) the current tax system penalizes circular activities, which are generally labour intensive, as opposed to new product manufacturing [...] Read more.
(This article belongs to the Section Economic and Business Aspects of Sustainability)

Open Access Erratum

Erratum: Wang et al. Urbanization Impacts on Natural Habitat and Ecosystem Services in the Guangdong-Hong Kong-Macao "Megacity". *Sustainability* 2020, *12*, 6675

by Wenjing Wang, Tong Wu, Yuanzheng Li, Shilin Xie, Baolong Han, Hua Zheng and Zhiyun Ouyang
Sustainability **2021**, *13*(8), 4580; **https://doi.org/10.3390/su13084580** - 20 Apr 2021
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Abstract The authors would like to make the following correction about the published paper [...] Full articl
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The Impact of Cross-Border R&D Sourcing on the Innovation Quality of MNCs, from the Perspective of Business Model Innovation

by Yunlong Duan, Hanxiao Liu, Zhiqing Deng and Peng Tao
Sustainability **2021**, *13*(8), 4579; **https://doi.org/10.3390/su13084579** - 20 Apr 2021
Viewed by 526

Abstract In the literature on business model innovation (BMI) in multinational corporations (MNCs), the influence of cross-border R&D (Research and development) sourcing on innovation performance has been widely discussed; however, from a BMI perspective, apart from innovation performance, the innovation quality is also important. [...] Read more.
(This article belongs to the Special Issue Sustainable Cross-Border Business Models)

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How Clusters Create Shared Value in Rural Areas: An Examination of Six Case Studies

by George Martinidis, Muluken Elias Adamseged, Arkadiusz Dyjakon, Yannis Fallas, Angeliki Foutri, Philipp Grundmann, Karen Hamann, Stanisław Minta, Nikolaos Ntavos, Tora Råberg, Silvia Russo and Davide Viaggi

Sustainability **2021**, *13*(8), 4578; **https://doi.org/10.3390/su13084578** - 20 Apr 2021

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Abstract The main aim of this paper is to demonstrate that clusters can support the sustainable development of rural areas through the creation of shared value. This is done via the close exam-ination of six different cases of rural clusters in Greece, Italy, Germany, [...] Read more.

(This article belongs to the Section Economic and Business Aspects of Sustainability)

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Activating Data through Eco-Didactic Design in the Public Realm: Enabling Sustainable Development in Cities

by Carmela Cucuzzella, Morteza Hazbei and Sherif Goubran

Sustainability **2021**, *13*(8), 4577; **https://doi.org/10.3390/su13084577** - 20 Apr 2021

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Abstract This paper explores how design in the public realm can integrate city data to help disseminate the information embedded within it and provide urban opportunities for knowledge exchange. The hypothesis is that such art and design practices in public spaces, as places of [...] Read more.

(This article belongs to the Special Issue Eco-Didactic Art, Design, and Architecture in the Public Realm)

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Modeling Surface Water Quality Using the Adaptive Neuro-Fuzzy Inference System Aided by Input Optimization

by Muhammad Izhar Shah, Taher Abunama, Muhammad Faisal Javed, Faizal Bux, Ali Aldrees, Muhammad Atiq Ur Rehman Tariq and Amir Mosavi

Sustainability **2021**, *13*(8), 4576; **https://doi.org/10.3390/su13084576** - 20 Apr 2021

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Abstract Modeling surface water quality using soft computing techniques is essential for the effective management of scarce water resources and environmental protection. The development of accurate predictive models with significant input parameters and inconsistent datasets is still a challenge. Therefore, further research is needed [...] Read more.

(This article belongs to the Special Issue Modeling and Simulations for Sustainable Water Environments)

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Self-Efficacy, Positive Future Outlook and School Burnout in Spanish Adolescents

by África Martos Martínez, María del Mar Molero Jurado, María del Carmen Pérez-Fuentes, Ana Belén Barragán Martín, María del Mar Simón Márquez, Begoña María Tortosa Martínez, Maria Sisto and José Jesús Gázquez Linares

Sustainability **2021**, *13*(8), 4575; **https://doi.org/10.3390/su13084575** - 20 Apr 2021

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Abstract Background: Environmental and personal circumstances during adolescence cause changes affecting students, their wellbeing, performance, self-efficacy, motivation, and aspirations for the future. The objective of this study was to analyze the relationship between burnout, self-efficacy, and outlooks by student gender and age, and determine [...] Read more.

(This article belongs to the Special Issue Strategies for Coping with Daily Stress and Related Educational and Psychosocial Factors)

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The Dual Impacts of Green Credit on Economy and Environment: Evidence from China

by Yanli Wang, Xiaodong Lei, Dongxiao Zhao, Ruyin Long and Meifen Wu

Sustainability **2021**, *13*(8), 4574; **https://doi.org/10.3390/su13084574** - 20 Apr 2021

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Abstract Green credit is regarded as an important means to promote sustainable growth. Based on the provincial panel dataset of China from 2007 to 2017, this paper investigates the dual impacts of green credit on the economy and environment, and it establishes mediating effect [...] Read more.

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The Mechanisms for Business Ecosystem Members to Capture Part of a Business Ecosystem's Joint Created Value

by Haruo Awano and Masaharu Tsujimoto
Sustainability **2021**, *13*(8), 4573; **https://doi.org/10.3390/su13084573** - 20 Apr 2021
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Abstract Research into business ecosystems has rarely examined the success of business ecosystem members. Business ecosystem leaders tend to focus on their own success rather than carefully monitoring the success of business ecosystem members, and each member must find a mechanism to capture part [...] Read more.

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Application of Artificial Neural Networks to Streamline the Process of Adaptive Cruise Control

by Jiří David, Pavel Brom, František Starý, Josef Bradáč and Vojtěch Dynybyl
Sustainability **2021**, *13*(8), 4572; **https://doi.org/10.3390/su13084572** - 20 Apr 2021
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Abstract This article deals with the use of neural networks for estimation of deceleration model parameters for the adaptive cruise control unit. The article describes the basic functionality of adaptive cruise control and creates a mathematical model of braking, which is one of the [...] Read more.
(This article belongs to the Special Issue Green ICT, Artificial Intelligence and Smart Cities)

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Elevated Tropospheric Ozone Concentration Alters Soil CO_2 Emission: A Meta-Analysis

by Enzhu Hu, Zhimin Ren, Sheng Xu and Weiwei Zhang
Sustainability **2021**, *13*(8), 4571; **https://doi.org/10.3390/su13084571** - 20 Apr 2021
Viewed by 426

Abstract Elevated tropospheric ozone (O_3) concentration may substantially influence the below-ground processes of terrestrial ecosystems. Nevertheless, a comprehensive and quantitative understanding of O_3 impacts on soil CO_2 emission remains elusive, making the future sources or sinks of soil C uncertain. [...] Read more.
(This article belongs to the Section Air, Climate Change and Sustainability)

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The Interconnection between Decent Workplace and Firm Financial Performance through the Mediation of Environmental Sustainability: Lessons from an Emerging Economy

by Muhammad Zahid, José Moleiro Martins, Haseeb Ur Rahman, Mário Nuno Mata, Syed Asim Shah and Pedro Neves Mata
Sustainability **2021**, *13*(8), 4570; **https://doi.org/10.3390/su13084570** - 20 Apr 2021
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Abstract This study aimed to investigate the impact of some important Sustainable Development Goals (SDGs), such as the decent workplace, climate change, and economic sustainability on firm financial performance (see Goals 8 and 13). By adopting an index from the previous literature, this study [...] Read more.
(This article belongs to the Special Issue Integrating Sustainability and Gender Equity: Emerging Trends in Business Policy, Strategy, and Practice)

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A Higher Step Count Is Associated with the Better Evaluation of Physical Education Lessons in Adolescents

by Karel Frömel, Krzysztof Skalik, Zbyněk Svozil, Dorota Groffik and Josef Mitáš
Sustainability **2021**, *13*(8), 4569; **https://doi.org/10.3390/su13084569** - 20 Apr 2021
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Abstract The current study aimed to determine: (a) the step counts of boys and girls in habitual physical education (PE) lessons during school teaching practice, (b) the association between the physical load and the evaluation of PE lessons in boys and girls, and (c) [...] Read more.
(This article belongs to the Collection Sustainability, Motivation and the Teaching-Learning Process in Physical Education and Sport)

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Lusophone Entrepreneurship: Analysis of Entrepreneurial Behavioural Characteristics in Brazilian and Portuguese Universities

by Débora Regina Schneider Locatelli, Paulo Jorge Reis Mourão and Rui Silva
Sustainability **2021**, *13*(8), 4568; **https://doi.org/10.3390/su13084568** - 20 Apr 2021
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Abstract This study analyzes the entrepreneurial characteristics of students from public universities. The objective was to evaluate the presence of the characteristics of entrepreneurship pointed out by McClelland through a comparative analysis between two countries and through an analysis using structural models. Data collection [...] Read more.

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A Multilevel Model of Environmentally Specific Social Identity in Predicting Environmental Strategies: Evidence from Technology Manufacturing Businesses

by Stanley Y. B. Huang, Chih-Wen Ting and Yu-Ming Fei
Sustainability **2021**, *13*(8), 4567; **https://doi.org/10.3390/su13084567** - 20 Apr 2021
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Abstract This study proposed a multilevel model of environmentally specific social identity based on upper echelons theory and examined how environmentally specific transformational leadership influenced the environmentally specific social identity of the top management team (TMT), which consequently influenced a corporation's choices of proactive [...] Read more.
(This article belongs to the Section Psychology of Sustainability and Sustainable Development)

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Information Transmission Mechanism of Inequality of Opportunity and Effort on Settlement Intention

by Junjie Gao, Lyubing Feng and Xianguo Yao
Sustainability **2021**, *13*(8), 4566; **https://doi.org/10.3390/su13084566** - 20 Apr 2021
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Abstract China is promoting sustainable economic development through urbanisation, but migrants' low settlement intention has become an obstacle to the urbanisation process. The key leading to this problem is that the current economic system lacks an index with high information transparency to convey the [...] Read more.

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Open Access Editor's Choice Article

How the SP System May Promote Sustainability in Energy Consumption in IT Systems

by J. Gerard Wolff
Sustainability **2021**, *13*(8), 4565; **https://doi.org/10.3390/su13084565** - 20 Apr 2021
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Abstract The *SP System* (SPS), referring to the *SP Theory of Intelligence* and its realisation as the *SP Computer Model*, has the potential to reduce demands for energy from IT, especially in AI applications and in the processing of big data, in addition [...] Read more.
(This article belongs to the Special Issue Smart Energy for a Sustainable Future. Experiences in Photovoltaic System Monitoring)

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The Role of Self- and Informant-Reports on Symptoms and Impairments in the Clinical Evaluation of Adult ADHD

by Nana Guo, Anselm B. M. Fuermaier, Janneke Koerts, Bernhard W. Mueller, Christian Mette, Lara Tucha, Norbert Scherbaum and Oliver Tucha
Sustainability **2021**, *13*(8), 4564; **https://doi.org/10.3390/su13084564** - 20 Apr 2021
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Abstract Little is known about which clinical features may aid the differentiation between attention deficit hyperactivity disorder (ADHD) and other clinical conditions. This study seeks to determine the role of self- and informant reports on symptoms and impairments in the clinical evaluation of adult [...] Read more.
(This article belongs to the Special Issue Sustained Change in ADHD: Interventions and Variables That Lead to Durable Improvements in Symptoms and Quality of Life)

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Barriers on Establishing Passive Strategies in Office Spaces: A Case Study in a Historic University Building

by Nuno Baía Saraiva, Luisa Dias Pereira, Adélio Rodrigues Gaspar and José Joaquim da Costa
Sustainability **2021**, *13*(8), 4563; **https://doi.org/10.3390/su13084563** - 20 Apr 2021
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Abstract The adaptation of spaces to different usage typologies can be complex in heritage buildings. Facilities were initially planned for a specific type of use that, when changed, require additional measures to ensure a suitable indoor environment. Passive strategies—e.g., free cooling—are commonly used as [...] Read more.
(This article belongs to the Special Issue Advances in Historic Buildings Conservation and Energy Efficiency)

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A Methodology for Assessing the Impact of Living Labs on Urban Design: The Case of the Furnish Project

by Inés Aquilué, Angélica Caicedo, Joan Moreno, Miquel Estrada and Laia Pagès
Sustainability **2021**, *13*(8), 4562; **https://doi.org/10.3390/su13084562** - 20 Apr 2021
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Abstract This paper presents a framework to support the assessment of urban design projects through Urban Living Labs (ULLs). The framework is based on the Tactical Urbanism (TU) practices and involves the use of Mobile Urban Elements (MUE) in uncertain and potentially confusing conditions [...] Read more.
(This article belongs to the Collection Sustainable Urban Mobility Project)

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Environmental Taxes and Innovation in Chinese Textile Enterprises: Influence of Mediating Effects and Heterogeneous Factors

by Yabin Yu and Hua Cheng
Sustainability **2021**, *13*(8), 4561; **https://doi.org/10.3390/su13084561** - 20 Apr 2021
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Abstract Climate change and environmental conditions call for more attention to be paid to eco-friendly economic behavior. As a market-oriented environmental regulation, environmental tax can stimulate and guide enterprises' environmental innovation in a neutral way. However, what elements connect the environmental tax and enterprise [...] Read more.

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Biogas as a Transport Fuel—A System Analysis of Value Chain Development in a Swedish Context

by Muhammad Arfan, Zhao Wang, Shveta Soam and Ola Eriksson
Sustainability **2021**, *13*(8), 4560; **https://doi.org/10.3390/su13084560** - 20 Apr 2021
Cited by 1 | Viewed by 599

Abstract Biofuels policy instruments are important in the development and diffusion of biogas as a transport fuel in Sweden. Their effectiveness with links to geodemographic conditions has not been analysed systematically in studying biogas development in a less urbanised regions, with high potential and [...] Read more.
(This article belongs to the Special Issue Economic, Environmental and Social Impact Assessment of Renewable Energy from Biomass)

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Assessment of Heavy Metals in Agricultural Land: A Literature Review Based on Bibliometric Analysis

by Pengnan Xiao, Yong Zhou, Xigui Li, Jie Xu and Chong Zhao
Sustainability **2021**, *13*(8), 4559; **https://doi.org/10.3390/su13084559** - 20 Apr 2021
Cited by 1 | Viewed by 473

Abstract A great amount of negative influence on human existence and environmental protection has been brought on by heavy metal pollution in agriculture soil. Thus, major awareness has been diverted to the evaluation of heavy metals (EHM) in agricultural land, which is used to [...] Read more.

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Blood Diamonds and Ethical Consumerism: An Empirical Investigation

by Meike Schulte, Sreejith Balasubramanian and Cody Morris Paris
Sustainability **2021**, *13*(8), 4558; **https://doi.org/10.3390/su13084558** - 20 Apr 2021
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Abstract Although ethical consumerism has witnessed significant interest in recent years, most studies have focused on low-value, commoditized product categories such as food and beverage and apparel. Despite its significance, the research on ethical consumerism in luxury product segments such as diamonds is relatively [...] Read more.
(This article belongs to the Section Economic and Business Aspects of Sustainability)

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Interior Design with Consumers' Perception about Art, Brand Image, and Sustainability

by Jeongah Kim and Wookjae Heo
Sustainability **2021**, *13*(8), 4557; **https://doi.org/10.3390/su13084557** - 20 Apr 2021
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Abstract In this study, the main research purpose was to determine whether artistic components of interior design in a store lead consumers to have different perceptions of the store. There were three main research questions. The first was whether consumers perceived the artistic components [...] Read more.
(This article belongs to the Special Issue New Trends and Patterns in Consumer Behavior and Sustainable Consumption)

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Municipal Solid Waste Management Practices and Challenges in the Southeastern Coastal Cities of Sri Lanka

by Abdul Majeed Aslam Saja, Abdul Majeed Zarafath Zimar and Sainulabdeen Mohamed Junaideen
Sustainability **2021**, *13*(8), 4556; **https://doi.org/10.3390/su13084556** - 20 Apr 2021
Cited by 1 | Viewed by 636

Abstract Municipal solid waste management (MSWM) has become a major challenge in Sri Lanka for post-conflict development activities. Many urban areas are facing severe problems in managing 10 to 50 metric tons of waste per day. However, limited research has been carried out to [...] Read more.
(This article belongs to the Special Issue Municipal Solid Waste Management in a Circular Economy)

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Integrating Multivariate and Univariate Statistical Models to Investigate Genotype–Environment Interaction of Advanced Fragrant Rice Genotypes under Rainfed Condition

by Norainy Hashim, Mohd Y. Rafii, Yusuff Oladosu, Mohd Razi Ismail, Asfaliza Ramli, Fatai Arolu and Samuel Chukwu
Sustainability **2021**, *13*(8), 4555; **https://doi.org/10.3390/su13084555** - 20 Apr 2021
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Abstract Specialty fragrant rice is sold at a premium price in both local and international trade because of its superior grain qualities. In this research, 40 advanced fragrant rice accessions were evaluated in different environments. The primary objective was to identify genotypes with high [...] Read more.

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Resilience Dividends and Resilience Windfalls: Narratives That Tie Disaster Resilience Co-Benefits to Long-Term Sustainability

by Jennifer Helgeson and Cheyney O'Fallon
Sustainability **2021**, *13*(8), 4554; **https://doi.org/10.3390/su13084554** - 20 Apr 2021
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Abstract The need for increased disaster resilience planning, especially at the community level, as well as the need to address sustainability are clear; these dual objectives have been deemed national priorities in a number of recent US Executive Orders. Major global climate agreements, (i.e., [...] Read more.
(This article belongs to the Special Issue From Disaster Resilience to Sustainability: Finding the Path)

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Particulate Matter Short-Term Exposition, Mobility Trips and COVID-19 Diffusion: A Correlation Analyses for the Italian Case Study at Urban Scale

by Armando Cartenì, Furio Cascetta, Luigi Di Francesco and Felisia Palermo
Sustainability **2021**, *13*(8), 4553; **https://doi.org/10.3390/su13084553** - 20 Apr 2021
Cited by 2 | Viewed by 741

Abstract The conjecture discussed in this paper was that the daily number of certified cases of COVID-19 is direct correlated to the average particular matter (PM) concentrations observed several days before when the contagions occurred (short-term effect), and this correlation is higher for areas [...] Read more.
(This article belongs to the Special Issue Transportation Planning, Mobility Habits and Sustainable Development in the Era of COVID-19 Pandemic)

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A Comparative Study of Models for the Construction Duration Prediction in Highway Road Projects of India

by P. Velumani, N. V. N. Nampoothiri and M. Urbański
Sustainability **2021**, *13*(8), 4552; **https://doi.org/10.3390/su13084552** - 20 Apr 2021
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Abstract Predicting the duration of construction projects with acceptable accuracy is a problem for contractors and researchers. Numerous researchers and tools are involved in sorting out this problem. The aim of the study is to predict the construction duration using four analytical tools as [...] Read more.
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Nutrient Use Efficiency as a Strong Indicator of Nutritional Security and Builders of Soil Nutrient Status through Integrated Nutrient Management Technology in a Rice-Wheat System in Northwestern India

by Mehakpreet Kaur Randhawa, Salwinder Singh Dhaliwal, Vivek Sharma, Amardeep Singh Toor, Sandeep Sharma, Manpreet Kaur and Gayatri Verma
Sustainability **2021**, *13*(8), 4551; **https://doi.org/10.3390/su13084551** - 20 Apr 2021
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Abstract Nutrient use efficiency is reported as a strong indicator of the buildup soil nutrient status for nutritional security of crops through an integrated nutrient management approach under a rice-wheat system. The data revealed that integrated application of manures and fertilizers reported maximum organic [...] Read more.

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Spatio-Temporal Differentiation Mode and Threshold Effect of Yangtze River Delta Urban Ecological Well-Being Performance Based on Network DEA

by Meijuan Hu, Suleman Sarwar and Zaijun Li
Sustainability **2021**, *13*(8), 4550; **https://doi.org/10.3390/su13084550** - 20 Apr 2021
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Abstract Improving ecological well-being performance (EWP) is the essential requirement of green transformation development and ecological civilization construction. With the help of a network DEA model and threshold panel regression model, this study evaluated urban ecological well-being performance to explore the evolution process, impact, [...] Read more.
(This article belongs to the Special Issue The Role of Economic Activities, Governance, Energy, and Environmental Economy to Achieve Sustainable Economic Growth)

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On the Investigation of Energy Efficient Torque Distribution Strategies through a Comprehensive Powertrain Model

by Sara Salamone, Basilio Lenzo, Giovanni Lutzemberger, Francesco Bucchi and Luca Sani
Sustainability **2021**, *13*(8), 4549; **https://doi.org/10.3390/su13084549** - 20 Apr 2021
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Abstract In electric vehicles with multiple motors, the torque at each wheel can be controlled independently, offering significant opportunities for enhancing vehicle dynamics behaviour and system efficiency. This paper investigates energy efficient torque distribution strategies for improving the operational efficiency of electric vehicles with [...] Read more.
(This article belongs to the Special Issue Energy Efficiency of Electric Vehicles with Multiple Motors)

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Analysis of Corporate Social Responsibility Execution Effects on Purchase Intention with the Moderating Role of Customer Awareness

by Qingyu Zhang and Sohail Ahmad
Sustainability **2021**, *13*(8), 4548; **https://doi.org/10.3390/su13084548** - 20 Apr 2021
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Abstract Corporate social responsibility (CSR) in management domains is a well-known concept that links corporate interests and environmental/community values. CSR is considered a strategic policy that offers environmental and social competitive advantages. Organizations consider that CSR-based goodwill provides a tactical competitive edge and sustainable [...] Read more.

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Oil and Flower Production in *Rosa damascena trigintipetala Dieck* under Salinity Stress in Taif Region, Saudi Arabia

by Mohamed E. El-Sharnouby, Metwally M. Montaser and Sliai M. Abdallah
Sustainability **2021**, *13*(8), 4547; **https://doi.org/10.3390/su13084547** - 19 Apr 2021
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Abstract The flower industry depends on oil and fragrance, which is addressed in the current work. Different concentrations of NaCl (0, 250, 500, 1000, and 1500 ppm) were applied to Taif rose plants (*Rosa damascena var. trigintipetala Dieck*) to evaluate their effects [...] Read more.

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Preparation of Electric- and Magnetic-Activated Water and Its Influence on the Workability and Mechanical Properties of Cement Mortar

by Kaiyue Zhao, Peng Zhang, Bing Wang, Yupeng Tian, Shanbin Xue and Yuan Cong
Sustainability **2021**, *13*(8), 4546; **https://doi.org/10.3390/su13084546** - 19 Apr 2021
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Abstract Cement-based materials prepared with activated water induced by a magnetic field or electric field represent a possible solution to environmental issues caused by the worldwide utilization of chemical admixtures. In this contribution, electric- and magnetic-activated water have been produced. The workability and mechanical [...] Read more.
(This article belongs to the Special Issue Sustainable Concrete Materials and Technologies)

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Improving Adolescents' Attitudes towards Persons with Disabilities: An Intervention Study in Secondary Education

by Julián Álvarez-Delgado, Benito León-del-Barco, María-Isabel Polo-del-Río, Víctor-María López-Ramos and Santiago Mendo-Lázaro
Sustainability **2021**, *13*(8), 4545; **https://doi.org/10.3390/su13084545** - 19 Apr 2021
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Abstract The relationship of disabled persons with their environment is fundamental. Attitudes towards them, understood as the social constructs of those around them, play a key role in a person's development and future, as they are one of the fundamental elements that can facilitate [...] Read more.
(This article belongs to the Special Issue Sustainable Education: The Educational Response to Students with Disabilities)

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Ecosystem-Based Food Production: Consumers' Preferred Practices and Willingness to Buy and Pay

by Eija Pouta, Eero Liski, Annika Tienhaara, Kauko Koikkalainen and Antti Miettinen
Sustainability **2021**, *13*(8), 4542; **https://doi.org/10.3390/su13084542** - 19 Apr 2021
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Abstract Ecosystem-based agricultural practices that utilize ecosystem processes aim to either reduce the negative externalities of agricultural production or increase the production of ecosystem services other than food provision. We examined consumer interest in buying and paying for food produced using ecosystem-based agricultural practices. [...] Read more.
(This article belongs to the Special Issue Agricultural Economics and Sustainable Food Consumption)

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A New Efficient Architecture for Adaptive Bit-Rate Video Streaming

by Muhammad Hamza Bin Waheed, Faisal Jamil, Amir Qayyum, Harun Jamil, Omar Cheikhrouhou, Muhammad Ibrahim, Bharat Bhushan and Habib Hmam

Sustainability **2021**, *13*(8), 4541; **https://doi.org/10.3390/su13084541** - 19 Apr 2021

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Abstract The demand for multimedia content over the Internet protocol network is growing exponentially with Internet users' growth. Despite high reliability and well-defined infrastructure for Internet protocol communication, Quality of Experience (QoE) is the primary focus of multimedia users while getting multimedia contents with [...] Read more.

(This article belongs to the Special Issue Machine Learning, Data Mining, and IoT Applications in Smart and Sustainable Networks)

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The Life Cycle Energy Consumption and Emissions of Asphalt Pavement Incorporating Basic Oxygen Furnace Slag by Comparative Study

by Jun Xie, Zhihu Wang, Fusong Wang, Shaopeng Wu, Zongwu Chen and Chao Yang

Sustainability **2021**, *13*(8), 4540; **https://doi.org/10.3390/su13084540** - 19 Apr 2021

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Abstract Basic Oxygen Furnace Slag (BOF), as alternatives for aggregate in asphalt pavement construction, is beneficial to the environment by reducing land occupation and resource consumption. However, the quantitative effects on energy consumption and emissions reduction remains poorly understood due to the unavailability of [...] Read more.

(This article belongs to the Special Issue Recycled Materials and Infrastructure Sustainability)

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From Goods to Services and from Linear to Circular: The Role of Servitization's Challenges and Drivers in the Shifting Process

by David Hidalgo-Carvajal, Ruth Carrasco-Gallego and Gustavo Morales-Alonso

Sustainability **2021**, *13*(8), 4539; **https://doi.org/10.3390/su13084539** - 19 Apr 2021

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Abstract To move closer to achieving the United Nations' Sustainable Development Goals (SDGs), a change from the traditional paradigm of the linear economy towards the circular economy is of paramount importance. One of the key promoters of this shift is servitization, which involves a [...] Read more.

(This article belongs to the Special Issue Sharing for Caring: On the Role of Collaborative Economy in the Sustainable Development Goals (SDGs))

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Flexible Workflow for Determining Critical Hazard and Exposure Scenarios for Assessing SLODs Risk in Urban Built Environments

by Juan Diego Blanco Cadena, Graziano Salvalai, Michele Lucesoli, Enrico Quagliarini and Marco D'Orazio

Sustainability **2021**, *13*(8), 4538; **https://doi.org/10.3390/su13084538** - 19 Apr 2021

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Abstract Urban Built Environments (UBE) are increasingly prone to SLow-Onset Disasters (SLODs) such as air pollution and heatwaves. The effectiveness of sustainable risk-mitigation solutions for the exposed individuals' health should be defined by considering the effective scenarios in which emergency conditions can appear. Combining [...] Read more.

(This article belongs to the Special Issue Simulations and Methods for Disaster Risk Reduction in Sustainable Built Environments)

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Consumer's Surplus: An Equity Measure of High Speed Rail Investments

by Francesca Pagliara

Sustainability **2021**, *13*(8), 4537; **https://doi.org/10.3390/su13084537** - 19 Apr 2021

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Abstract An economic analysis identifies, measures, and compares the costs and benefits of alternative interventions, with the objective of supporting decisions concerning the best use of limited resources. The cost benefit analysis (CBA) has played a significant role within the entire decision-making process, and [...] Read more.

(This article belongs to the Special Issue High-Speed Rail, Equity, and Inclusion)

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Agricultural Tractor Roll-Over Related Fatalities in Italy: Results from a 12 Years Analysis

by Davide Facchinetti, Stefano Santoro, Lavinia Eleonora Galli and Domenico Pessina
Sustainability **2021**, *13*(8), 4536; **https://doi.org/10.3390/su13084536** - 19 Apr 2021
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Abstract In Italy, about 160 fatal accidents per year have occurred recently in agriculture, most of them involving agricultural machinery. The most frequent cause of fatal events is the tractor overturning. One of the opportunities to monitor the trend of agricultural tractors fatal overturning [...] Read more.
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Effects of Shelter Forests on Soil Organic Carbon of Irrigated Soils in the Taklimakan Desert

by Xuexi Ma, Zhengzhong Jin, Yingju Wang and Jiaqiang Lei
Sustainability **2021**, *13*(8), 4535; **https://doi.org/10.3390/su13084535** - 19 Apr 2021
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Abstract An experiment was carried out to test the effects of artificial vegetation on soil organic carbon in sandy soil. The soils were collected from the Taklimakan desert highway shelter forests with different stand age (the stand ages are 5, 7, 10, 13, 16, [...] Read more.

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Optimized Design of Structure of High-Bending-Rigidity Circular Tube

by Shaoying Li and Zhongquan Qu
Sustainability **2021**, *13*(8), 4534; **https://doi.org/10.3390/su13084534** - 19 Apr 2021
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Abstract Circular tubes are widely used in daily life and manufacture under bending load. The structural parameters of a circular tube, such as its wall thickness, number and shapes of ribs, and supporting flanges, are closely related to the tube's bending rigidity. In this [...] Read more.
(This article belongs to the Special Issue Structural Engineering and Sustainable Civil Construction)

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Modelling Individual Tree Diameter Growth of *Quercus mongolica* Secondary Forest in the Northeast of China

by Xuefan Hu, Guangshuang Duan and Huiru Zhang
Sustainability **2021**, *13*(8), 4533; **https://doi.org/10.3390/su13084533** - 19 Apr 2021
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Abstract *Quercus mongolica* secondary forest is widely distributed in the northeast of China, but it usually has low productivity, unstable structure, poor health, and low biodiversity. Diameter is a tree variable that is commonly used for forest growth measurement, to provide the basis for [...] Read more.
(This article belongs to the Special Issue Current Advances on Ecological Modeling for Sustainable Forest Management)

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Bridging Recognition of Prior Learning (RPL) and Corporate Social Responsibility (CSR): Circular Flow of Interaction among the University, Industry, and People

by Rumpa Roy and Hesham El Marsafawy
Sustainability **2021**, *13*(8), 4532; **https://doi.org/10.3390/su13084532** - 19 Apr 2021
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Abstract Universities foster a collaboration with industry with their commitment towards society. Corporate social responsibility (CSR) practices of organizations facilitate implementation of the recognition of prior learning (RPL) in higher education, while creating long-term opportunities for sustainable development. The researchers of this study come [...] Read more.
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An NN-Based Double Parallel Longitudinal and Lateral Driving Strategy for Self-Driving Transport Vehicles in Structured Road Scenarios

by Huiyuan Xiong, Huan Liu, Jian Ma, Yuelong Pan and Ronghui Zhang
Sustainability **2021**, *13*(8), 4531; **https://doi.org/10.3390/su13084531** - 19 Apr 2021
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Abstract Studies on self-driving transport vehicles have focused on longitudinal and lateral driving strategies in automated structured road scenarios. In this study, a double parallel network (DP-Net) combined with longitudinal and lateral strategy networks is constructed for self-driving transport vehicles in structured road scenarios, [...] Read more.
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Resource Endowment, Industrial Structure, and Green Development of the Yellow River Basin

by Kang Zhao, Rui Zhang, Hong Liu, Geyi Wang and Xialing Sun
Sustainability **2021**, *13*(8), 4530; **https://doi.org/10.3390/su13084530** - 19 Apr 2021
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Abstract The Yellow River Basin is an important energy base of China, and its green development is crucial to Chinese economic transformation. In this paper, we calculate the green total factor productivity (GTFP) to measure the green development level of the Yellow River Basin [...] Read more.

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Pedagogical Variables and Motor Commitment in the Planning of Invasion Sports in Primary Education

by Juan M. García-Ceberino, Sebastián Feu, María G. Gamero and Sergio J. Ibáñez
Sustainability **2021**, *13*(8), 4529; **https://doi.org/10.3390/su13084529** - 19 Apr 2021
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Abstract Research on Sports Pedagogy necessitates studying the knowledge possessed by pre-service teachers (PSTs) and its application in the planning of sports in school. The main objectives of this study were to consider if PSTs really apply their beliefs when planning their didactic units, [...] Read more.
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The Model of Vehicle and Route Selection for Energy Saving

by Olga Lingaitienė, Juozas Merkevičius and Vida Davidavičienė
Sustainability **2021**, *13*(8), 4528; **https://doi.org/10.3390/su13084528** - 19 Apr 2021
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Abstract The World Bank, United Nations, the Organization for Economic Cooperation and Development, and others are in line with the governments of countries that are strongly interested in the sustainable development of countries, regions, and enterprises. One of the aspects that affects the indicators [...] Read more.
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A Comparison of Different Approaches for Assessing Energy Outputs of Combined Heat and Power Geothermal Plants

by Daniele Fiaschi, Giampaolo Manfrida, Barbara Mendecka, Lorenzo Tosti and Maria Laura Parisi
Sustainability **2021**, *13*(8), 4527; **https://doi.org/10.3390/su13084527** - 19 Apr 2021
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Abstract In this paper, we assess using two alternative allocation schemes, namely exergy and primary energy saving (PES) to compare products generated in different combined heat and power (CHP) geothermal systems. In particular, the adequacy and feasibility of the schemes recommended for allocation are [...] Read more.
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Field Environmental Philosophy: A Biocultural Ethic Approach to Education and Ecotourism for Sustainability

by Alejandra Tauro, Jaime Ojeda, Terrance Caviness, Kelli P. Moses, René Moreno-Terrazas, T. Wright, Danqiong Zhu, Alexandria K. Poole, Francisca Massardo and Ricardo Rozzi

Sustainability **2021**, *13*(8), 4526; **https://doi.org/10.3390/su13084526** - 19 Apr 2021

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Abstract To contribute to achieving local and global sustainability, we propose a novel educational methodology, called field environmental philosophy (FEP), which orients ecotourism practices to reconnect citizens and nature. FEP is based on the systemic approach of the biocultural ethic that values the vital [...] Read more.

(This article belongs to the Special Issue Sustainable Environmental Beliefs)

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Knowledge Production and Land Relations in the Bioeconomy. A Case Study on the Brazilian Sugar-Bioenergy Sector

by Maria Backhouse and Kristina Lorenzen

Sustainability **2021**, *13*(8), 4525; **https://doi.org/10.3390/su13084525** - 19 Apr 2021

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Abstract National bioeconomy strategies aim for a comprehensive transition from a fossil-based to a biomass-based economy. One common feature of the strategies is the optimistic reliance on technology as main tool in order to overcome the socio-ecological crisis. From the critical perspectives of political [...] Read more.

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Ranking Locations for Hydrogen Production Using Hybrid Wind-Solar: A Case Study

by Khalid Almutairi, Ali Mostafaeipour, Ehsan Jahanshahi, Erfan Jooyandeh, Youcef Himri, Mehdi Jahangiri, Alibek Issakhov, Shahariar Chowdhury, Seyyed Jalaladdin Hosseini Dehshiri, Seyyed Shahabaddin Hosseini Dehshiri and Kuaanan Techato

Sustainability **2021**, *13*(8), 4524; **https://doi.org/10.3390/su13084524** - 19 Apr 2021

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Abstract Observing the growing energy demand of modern societies, many countries have recognized energy security as a looming problem and renewable energies as a solution to this issue. Renewable hydrogen production is an excellent method for the storage and transfer of energy generated by [...] Read more.

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Improved Control Method for Voltage Regulation and Harmonic Mitigation Using Electric Spring

by Mahdi Shademan, Alireza Jalilian and Mehdi Savaghebi

Sustainability **2021**, *13*(8), 4523; **https://doi.org/10.3390/su13084523** - 19 Apr 2021

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Abstract An electric spring (ES) with series connection to non-critical loads (NCLs) is mainly known as a smart load (SL) technology that can compensate undervoltages and overvoltages. In this paper, an improved control method is presented for the electric spring to regulate the effective [...] Read more.

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Effects of Olive Mill Vegetation Water Phenol Metabolites Transferred to Muscle through Animal Diet on Rabbit Meat Microbial Quality

by Raffaella Branciari, Roberta Galarini, Massimo Trabalza-Marinucci, Dino Miraglia, Rossana Roila, Gabriele Acuti, Danilo Giusepponi, Alessandro Dal Bosco and David Ranucci

Sustainability **2021**, *13*(8), 4522; **https://doi.org/10.3390/su13084522** - 19 Apr 2021

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Abstract The present study evaluated the effects of feed supplementation with olive oil by-products on the microbial quality of rabbit meat. Thirty-three New Zealand White rabbits were randomly assigned to three experimental grower–finisher diets. Each dietary group consisted of three experimental treatments: (1) a [...] Read more.

(This article belongs to the Special Issue Safety and Quality of Sustainable Food)

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Military Leader Behavior Formation for Sustainable Country Security

by Svajone Bekesiene, Ieva Meidute-Kavaliauskiene and Šárka Hošková-Mayerová
Sustainability **2021**, *13*(8), 4521; **https://doi.org/10.3390/su13084521** - 19 Apr 2021
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Abstract The continuous improvement of military leadership identity to maintain excellent performance with respect to the promotion of mission success is a highly desired by the Lithuanian Armed Forces. This study seeks to identify the criteria for effective leadership behavior that is appreciated by [...] Read more.
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Does GATS' Influence on Private University Sector's Growth Ensure ESD or Develop City 'Sustainability Crisis'—Policy Framework to Respond COP21

by Gazi Mahabubul Alam, Samsilah Roslan, Abul Quasem Al-Amin and Walter Leal Filho
Sustainability **2021**, *13*(8), 4520; **https://doi.org/10.3390/su13084520** - 19 Apr 2021
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Abstract The conventions and ratifications made by the United Nations (UN) have a long history. They were well respected for their ability to unite the world's countries on some issues. The paradigm transformation of UN ratifications to combine both business models and social justice [...] Read more.
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Factors Influencing Entrepreneurial Intention of University Students in China: Integrating the Perceived University Support and Theory of Planned Behavior

by Yushun Su, Zeren Zhu, Jingwen Chen, Yuanqing Jin, Ting Wang, Chien-Liang Lin and Danying Xu
Sustainability **2021**, *13*(8), 4519; **https://doi.org/10.3390/su13084519** - 19 Apr 2021
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Abstract Entrepreneurial education has always played an important role in developing entrepreneurship. In recent years, China has been emphasizing the integration of innovative entrepreneurship concepts into university curricula. Entrepreneurial education can also contribute to the sustainability of business development. In the context of "mass [...] Read more.
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Development of Emergent Knowledge Strategies and New Dynamic Capabilities for Business Education in a Time of Crisis

by Eduardo Tomé and Elizaveta Gromova
Sustainability **2021**, *13*(8), 4518; **https://doi.org/10.3390/su13084518** - 19 Apr 2021
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Abstract The current pandemic is, above all, a crisis of knowledge—Humanity had to find a vaccine, and now we are not sure how to behave socially to minimize the pandemic bad effects. For organizations, this situation requires an update in the reflection regarding both [...] Read more.
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Integrated Healthcare and the Dilemma of Public Health Emergencies

by Krzysztof Goniewicz, Eric Carlström, Attila J. Hertelendy, Frederick M. Burkle, Mariusz Goniewicz, Dorota Lasota, John G. Richmond and Amir Khorram-Manesh
Sustainability **2021**, *13*(8), 4517; **https://doi.org/10.3390/su13084517** - 19 Apr 2021
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Abstract Traditional healthcare services have demonstrated structural shortcomings in the delivery of patient care and enforced numerous elements of integration in the delivery of healthcare services. Integrated healthcare aims at providing all healthcare that makes humans healthy. However, with mainly chronically ill people and [...] Read more.
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Working Capital Management Policies in Indian Listed Firms: A State-Wise Analysis

by Najib H. S Farhan, Faozi A. Almaqtari, Ebrahim Mohammed Al-Matari, Nabil Ahmed M. SENAN, Waleed M. Alahdal and Saddam A. Hazaea

Sustainability **2021**, *13*(8), 4516; **https://doi.org/10.3390/su13084516** - 19 Apr 2021

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Abstract The main aim of this paper is to evaluate the impact of working capital policies on firms' profitability. The study uses a panel data set of 829 manufacturing firms for the period from 2011 to 2017. Data is extracted from Prowess IQ database. [...] Read more.

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The Effect of Climate-Smart Agriculture on Soil Fertility, Crop Yield, and Soil Carbon in Southern Ethiopia

by Meron Tadesse, Belay Simane, Wuletawu Abera, Lulseged Tamene, Gebermedihin Ambaw, John W. Recha, Kindu Mekonnen, Getamesay Demeke, Abebe Nigussie and Dawit Solomon

Sustainability **2021**, *13*(8), 4515; **https://doi.org/10.3390/su13084515** - 19 Apr 2021

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Abstract It is critical to develop technologies that simultaneously improve agricultural production, offset impacts of climate change, and ensure food security in a changing climate. Within this context, considerable attention has been given to climate-smart agricultural practices (CSA). This study was conducted to investigate [...] Read more.

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Analysis of Changes in Suitable Habitat Areas of Paridae through Rooftop Greening Simulation—Case Study of Suwon-si, Gyeonggi-do, Republic of Korea

by Kyung Youl Baek, Ho Gul Kim and Sung-Ho Kil

Sustainability **2021**, *13*(8), 4514; **https://doi.org/10.3390/su13084514** - 19 Apr 2021

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Abstract As many people live in cities that lack green space, biodiversity in such areas is decreasing. Suwon, the study site, a city that strives to improve its biodiversity, is close to the capital city of the Republic of Korea (ROK), and has a [...] Read more.

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Exploring the Relationship between Communication and Success of Construction Projects: The Mediating Role of Conflict

by Summaira Malik, Muhammad Taqi, José Moleiro Martins, Mário Nuno Mata, João Manuel Pereira and António Abreu

Sustainability **2021**, *13*(8), 4513; **https://doi.org/10.3390/su13084513** - 19 Apr 2021

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Abstract The success of a construction project is a widely discussed topic, even today, and there exists a difference of opinion. The impact of communication and conflict on project success is an important, but least addressed, issue in literature, especially in the case of [...] Read more.

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Investigation of a Process to Eco-Design Led Lighting Products to Enhance the Adoption of Eco-Design Methods and Tools by Industry

by Jose L. Casamayor and Daizhong Su

Sustainability **2021**, *13*(8), 4512; **https://doi.org/10.3390/su13084512** - 19 Apr 2021

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Abstract To date, many studies have been carried out to develop new approaches and methods to eco-design products. However, these have not been implemented and adopted by industry as much as they should. A better understanding of real-world industrial eco-design and development processes, and [...] Read more.

(This article belongs to the Special Issue Design for Sustainability and Circular Economy)

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Smart Farming through Responsible Leadership in Bangladesh: Possibilities, Opportunities, and Beyond

by Amlan Haque, Nahina Islam, Nahidul Hoque Samrat, Shuvashis Dey and Biplob Ray
Sustainability **2021**, *13*(8), 4511; **https://doi.org/10.3390/su13084511** - 19 Apr 2021
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Abstract Smart farming has the potential to overcome the challenge of 2050 to feed 10 billion people. Both artificial intelligence (AI) and the internet of things (IoT) have become critical prerequisites to smart farming due to their high interoperability, sensors, and cutting-edge technologies. Extending [...] Read more.
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Educational Needs and Resources for Teachers Working with Students with Chronic Pain: Results of a Delphi Study

by Elena Castarlenas, Rubén Roy, Isabel Salvat, Pilar Montesó-Curto and Jordi Miró
Sustainability **2021**, *13*(8), 4510; **https://doi.org/10.3390/su13084510** - 19 Apr 2021
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Abstract Children and adolescents spend most of their time at school. Therefore, teachers could be of help to improve the quality of life of students with chronic pain while they are at school. The aim of this study was to identify teachers' educational needs [...] Read more.
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Open Access Review

A Systematic Review of the Hydrological, Environmental and Durability Performance of Permeable Pavement Systems

by Mariacrocetta Sambito, Alessandro Severino, Gabriele Freni and Larysa Neduzha
Sustainability **2021**, *13*(8), 4509; **https://doi.org/10.3390/su13084509** - 18 Apr 2021
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Abstract Due to urbanization, large portions of vegetated territory have been replaced by waterproof surfaces. The consequences are greater outflows, lower infiltration, and lower evapotranspiration. Pavement systems made with permeable surfaces allow the infiltration of water, ensuring reduction of runoff volume. In this paper, [...] Read more.
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Analysis of Heavy Metal Content in Soil and Plants in the Dumping Ground of Magnesite Mining Factory Jelšava-Lubeník (Slovakia)

by Lenka Štofejová, Juraj Fazekaš and Danica Fazekašová
Sustainability **2021**, *13*(8), 4508; **https://doi.org/10.3390/su13084508** - 18 Apr 2021
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Abstract A high content of heavy metals in the soil and plants of a magnesite mining area might cause serious damage to the environment and can be a threat to the health of the surrounding population. This paper presents the results of research that [...] Read more.
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International Student Engagement for Sustainability of Leisure Participation: An Integrated Approach of Means-End Chain and Acculturation

by Nahyun Lee and Bong-Seok Kim
Sustainability **2021**, *13*(8), 4507; **https://doi.org/10.3390/su13084507** - 18 Apr 2021
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Abstract This study examined international students' engagement in leisure activities using data derived from an integrated method and analyzed through acculturation and means-end chain approaches. A cluster analysis was conducted to identify acculturation types. An initial qualitative survey with 30 respondents produced the questionnaire [...] Read more.
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Study of the Variability in Fatty Acids and Carotenoid Profiles: Laying the Ground for Tank Milk Authentication

by Ana Villar, Ibán Vázquez-González, Fernando Vicente, Gregorio Salcedo, Laura González, Adrián Botana, Luis José Royo, Paola Eguinoa and Juan Busqué
Sustainability **2021**, *13*(8), 4506; **https://doi.org/10.3390/su13084506** - 18 Apr 2021
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Abstract This study analyzes 174 tank milk samples taken from 89 commercial farms located all along the Cantabrian Coast (Green Spain). Sampling was performed in two periods: autumn 2016 and spring 2017. A survey was carried out for every day of sampling to record [...] Read more.
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The Effect of Plants on the Energy Output of Green Roof Photovoltaic Systems in Tropical Climates

by Chila Kaewpraek, Liaqat Ali, Md. Arefin Rahman, Mohammad Shakeri, M. S. Chowdhury, M. S. Jamal, Md. Shahin Mia, Jagadeesh Pasupuleti, Le Khac Dong and Kuaanan Techato
Sustainability **2021**, *13*(8), 4505; **https://doi.org/10.3390/su13084505** - 18 Apr 2021
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Abstract The rapid rise in the number of fossil fuel uses over the last few decades has increased carbon dioxide (CO_2) emissions. The purpose of implementing renewable energy solutions, such as solar, hydro, wind, biomass, and other renewable energy sources, is to [...] Read more.
(This article belongs to the Special Issue New Approaches and Technologies in Thermal Comfort and Energy Consumption in Social Housing)

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Applying Values-Led Communication Design to Engage Stakeholders in Developing Dementia-Friendly Visitor Destinations

by Chih-Shiang (Mike) Wu and Tung-Jung (David) Sung
Sustainability **2021**, *13*(8), 4504; **https://doi.org/10.3390/su13084504** - 18 Apr 2021
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Abstract Developing dementia-friendly visitor destinations (DFVDs) has been acknowledged as essential for maintaining quality of life for people with dementia (PwD) and carers. While research has identified the lack of sufficient information as one of the major barriers in DFVD development, this study argues [...] Read more.
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Effect of Natural and Chemical Colorant Supplementation on Performance, Egg-Quality Characteristics, Yolk Fatty-Acid Profile, and Blood Constituents in Laying Hens

by Ahmed A. Saleh, Esraa Gawish, Samy F. Mahmoud, Khairy Amber, Wael Awad, Mohammed H. Alzawqari, Mustafa Shukry and Abdel-Moneim Eid Abdel-Moneim
Sustainability **2021**, *13*(8), 4503; **https://doi.org/10.3390/su13084503** - 18 Apr 2021
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Abstract Natural and chemical colorants are attracting a lot of attention as sustainable feed additives due to their effect on food color and because presentation matters to consumers. Color also is a major sensory factor that helps consumers determine food quality and its possible [...] Read more.
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Alternative Food Networks in Food System Transition—Values, Motivation, and Capacity Building among Young Swedish Market Gardeners

by Annie Drottberger, Martin Melin and Lotten Lundgren
Sustainability **2021**, *13*(8), 4502; **https://doi.org/10.3390/su13084502** - 18 Apr 2021
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Abstract This study sheds light on a new generation of Swedish food producers, market gardeners, who are attracting attention in terms of food system sustainability, prompted by increasing consumer awareness about the value of healthy and locally produced food. Market gardening is part of [...] Read more.

Stabilisation of a Plastic Soil with Alkali Activated Cements Developed from Industrial Wastes

by Nuno Cristelo, Jhonathan Rivera, Tiago Miranda and Ana Fernández-Jiménez
Sustainability **2021**, *13*(8), 4501; **https://doi.org/10.3390/su13084501** - 18 Apr 2021
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Abstract The development of alternative materials for the construction industry, based on different types of waste, is gaining significant importance in recent years. This is mostly due to the need to increase sustainability of this heavily polluting activity, thus mitigating the dependence on, for [...] Read more.
(This article belongs to the Special Issue Soil Stabilization in Sustainability)

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Integrating Mathematics and Science Teaching in the Context of Education for Sustainable Development: Design and Pilot Implementation of a Teaching-Learning Sequence about Air Quality with Pre-Service Primary Teachers

by Arantza Rico, Elena Agirre-Basurko, Aritz Ruiz-González, Igone Palacios-Agundez and Daniel Zuazagoitia
Sustainability **2021**, *13*(8), 4500; **https://doi.org/10.3390/su13084500** - 18 Apr 2021
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Abstract This article presents an interdisciplinary teaching–learning sequence (TLS) about air quality for pre-service primary teachers using an organic learning garden. The design involved a curricular integration of concepts and competences about sustainability, mathematics, and science disciplines following constructivist and active learning strategies, such [...] Read more.
(This article belongs to the Special Issue Education for Sustainable Development in Higher Education)

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The Development of Sustainable Assessment during the COVID-19 Pandemic: The Case of the English Language Program in South Korea

by Sun-Joo Chung and Lee-Jin Choi
Sustainability **2021**, *13*(8), 4499; **https://doi.org/10.3390/su13084499** - 18 Apr 2021
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Abstract The COVID-19 pandemic has posed challenges to educational systems around the world. In particular, language learning environments being impacted by the pandemic has resulted in a shift from traditional in-person to online language teaching. This paper examines the case of an English language [...] Read more.
(This article belongs to the Special Issue Sustainable Assessment in the Education System in the Age of COVID-19)

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Open Access Project Report

Interdisciplinary Reservoir Management—A Tool for Sustainable Water Resources Management

by Milan Daus, Katharina Koberger, Kaan Koca, Felix Beckers, Jorge Encinas Fernández, Barbara Weisbrod, Daniel Dietrich, Sabine Ulrike Gerbersdorf, Rüdiger Glaser, Stefan Haun, Hilmar Hofmann, Dominik Martin-Creuzburg, Frank Peeters and Silke Wieprecht
Sustainability **2021**, *13*(8), 4498; **https://doi.org/10.3390/su13084498** - 18 Apr 2021
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Abstract Reservoirs are a common way to store and retain water serving for a multitude of purposes like storage of drinking and irrigation water, recreation, flood protection, navigation, and hydropower production, and have been built since centuries. Today, few reservoirs serve only one purpose, [...] Read more.
(This article belongs to the Special Issue Freshwater Resources and Ecosystems in the Anthropocene: Challenges for a Sustainable Management)

Regenerating the Historic Urban Landscape through Circular Bottom-Up Actions: The Urban Seeding Process in Rijeka

by Marco Acri, Saša Dobričić and Maja Debevec
Sustainability **2021**, *13*(8), 4497; **https://doi.org/10.3390/su13084497** - 17 Apr 2021
Cited by 2 | Viewed by 746

Abstract The increasing pressure on urban resilience and the parallel interest in the preservation of the Historic Urban Landscape (HUL) have opened new frontiers of research that find, in the principles of the circular economy, good responses. Cities need to remake themselves from pure [...] Read more.
(This article belongs to the Special Issue The Valorization of the Cultural Heritage and Landscape as the Entrance Point for the Circular City Strategy)

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BIM and IoT Sensors Integration: A Framework for Consumption and Indoor Conditions Data Monitoring of Existing Buildings

by Giuseppe Desogus, Emanuela Quaquero, Giulia Rubiu, Gianluca Gatto and Cristian Perra
Sustainability **2021**, *13*(8), 4496; **https://doi.org/10.3390/su13084496** - 17 Apr 2021
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Abstract The low accessibility to the information regarding buildings current performances causes deep difficulties in planning appropriate interventions. Internet of Things (IoT) sensors make available a high quantity of data on energy consumptions and indoor conditions of an existing building that can drive the [...] Read more.
(This article belongs to the Special Issue Buildings and Infrastructures Management: Models Strategies and Evaluation Tools)

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Change in Gap Perception within Current Practices in Assessing Students Learning Mathematics

by Vlad I. Bocanet, Ken Brown, Anne Uukkivi, Filomena Soares, Ana Paula Lopes, Anna Cellmer, Carles Serrat, Cristina Feniser, Florina M. Serdean, Elena Safiulina, Gerald Kelly, Joanna Cymerman, Igor Kierkosz, Volodymyr Sushch, Marina Latõnina, Oksana Labanova, M. Montserrat Bruguera, Chara Pantazi and M. Rosa Estela
Sustainability **2021**, *13*(8), 4495; **https://doi.org/10.3390/su13084495** - 17 Apr 2021
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Abstract The COVID pandemic has touched many aspects of everyone's life. Education is one of the fields greatly affected by it, as students and teachers were forced to move online and quickly adapt to the online environment. Assessment is a crucial part of education, [...] Read more.
(This article belongs to the Special Issue Information Systems, E-learning and Knowledge Management)

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Green Marketing Strategies on Online Platforms: A Mixed Approach of Experiment Design and Topic Modeling

by Eunhye Park, Junehee Kwon and Sung-Bum Kim
Sustainability **2021**, *13*(8), 4494; **https://doi.org/10.3390/su13084494** - 17 Apr 2021
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Abstract This study aimed to examine the effects of two types of green information conveyed via online platforms and the moderating role of environmental consciousness on customers' green perceptions, positive attitudes, and behavioral intentions. This study performed a 2 (firm-initiated green information: absent, present) [...] Read more.
(This article belongs to the Special Issue Influencing Factors of Green Marketing and Sustainable Tourism on Companies, Brands, and Tourist Destinations)

The Interaction Effect of Information Systems of Shipping and Logistics Firms and Managers' Support for Blockchain Technology on Cooperation with Shippers for Sustainable Value Creation

by Hee-sung Bae
Sustainability **2021**, *13*(8), 4493; **https://doi.org/10.3390/su13084493** - 17 Apr 2021
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Abstract Firms apply new technology to value creation. In particular, blockchain technology increases transparency and stability of shipping and logistics firms and this is connected with a high level of collaboration with shippers. In this regard, the objective of this study is to verify [...] Read more.
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Example of Warehouse System Design Based on the Principle of Logistics

by Janka Saderova, Andrea Rosova, Marian Sofranko and Peter Kacmary
Sustainability **2021**, *13*(8), 4492; **https://doi.org/10.3390/su13084492** - 17 Apr 2021
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Abstract The warehouse process, as one of many logistics processes, currently holds an irreplaceable position in logistics systems in companies and in the supply chain. The proper function of warehouse operations depends on, among other things, the type of the used technology and their [...] Read more.
(This article belongs to the Special Issue Social Network Analysis for Logistics and Supply Chain Management)

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Lipid Extracts from *Caulerpa lentillifera* Waste: An Alternative Product in a Circular Economy

by Thanyarat Srinorasing, Nattayaporn Chirasuwan, Boosya Bunnag and Ratana Chaiklahan
Sustainability **2021**, *13*(8), 4491; **https://doi.org/10.3390/su13084491** - 17 Apr 2021
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Abstract Nowadays, a circular economy is one of the main strategies for developing a sustainable economy. The objective of this work was to increase the value of *Caulerpa lentillifera* waste and use it efficiently as a resource for lipid extraction. A crude lipid yield [...] Read more.

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Assessment of Indoor Environmental Quality in Budget Hotels Using Text-Mining Method: Case Study of Top Five Brands in China

by Zhifeng Shen, Xirui Yang, Chunlu Liu and Junjie Li
Sustainability **2021**, *13*(8), 4490; **https://doi.org/10.3390/su13084490** - 17 Apr 2021
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Abstract Guests' evaluation of indoor environmental quality (IEQ) is important for identifying environment quality problems in hotels and improving service quality. This paper aims to identify IEQ problems in budget hotels in China and improve them. Specifically, 2.06 million online reviews of budget hotels [...] Read more.
(This article belongs to the Special Issue Architecture and Indoor Environmental Quality)

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Creativity and Resilience as Predictors of Career Success

by José Ramón Fernández-Díaz, Mónica Gutiérrez-Ortega, Fátima Llamas-Salguero and Isabel Cantón-Mayo
Sustainability **2021**, *13*(8), 4489; **https://doi.org/10.3390/su13084489** - 17 Apr 2021
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Abstract Achieving success in today's society is becoming an increasingly complex endeavor. People must have high levels of creativity and resilience in order to constantly adapt to changing situations and, at the same time, maintain the necessary tenacity and enthusiasm to continue despite failures. [...] Read more.

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Development of Riparian and Groundwater-Dependent Ecosystem Assessments for National Forests in the Western U.S.

by Katelyn P. Driscoll and D. Max Smith
Sustainability **2021**, *13*(8), 4488; **https://doi.org/10.3390/su13084488** - 17 Apr 2021
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Abstract In 2012, the U.S. Department of Agriculture adopted a new planning rule that outlined a process for developing, amending, and revising land management plans for the 155 National Forests, 20 National Grasslands, and one Tallgrass Prairie managed by the U.S. Forest Service. The [...] Read more.
(This article belongs to the Special Issue Landscape Analysis, Planning and Regional Development)

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Evaluating Life Cycle of Buildings Using an Integrated Approach Based on Quantitative-Qualitative and Simplified Best-Worst Methods (QQM-SBWM)

by Maghsoud Amiri, Mohammad Hashemi-Tabatabaei, Mohammad Ghahremanloo, Mehdi Keshavarz-Ghorabaee, Edmundas Kazimieras Zavadskas and Arturas Kaklauskas
Sustainability **2021**, *13*(8), 4487; **https://doi.org/10.3390/su13084487** - 17 Apr 2021
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Abstract Evaluating the life cycle of buildings is a valuable tool for assessing sustainability and analyzing environmental consequences throughout the construction operations of buildings. In this study, in order to determine the importance of building life cycle evaluation indicators, a new combination method was [...] Read more.
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Intention to Purchase Active and Intelligent Packaging to Reduce Household Food Waste: Evidence from Italian Consumers

by Antonella Cammarelle, Rosaria Viscecchia and Francesco Bimbo
Sustainability **2021**, *13*(8), 4486; **https://doi.org/10.3390/su13084486** - 17 Apr 2021
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Abstract Innovations in food packaging, such as active and intelligent ones, improve food safety and lower household food waste by extending product shelf life and providing information about food quality, respectively. The consumer adoption of such innovations could contribute to reaching one of the [...] Read more.
(This article belongs to the Special Issue Human, Cultural, Social, Political and Environmental Dimensions for a New Vision of the Sustainable Agro-Food System Post COVID-19)

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The Potential of a New Commercial Seaweed Extract in Stimulating Morpho-Agronomic and Bioactive Properties of *Eruca vesicaria* (L.) Cav.

by Shimaa M. Hassan, Mohamed Ashour, Ahmed A. F. Soliman, Hesham A. Hassanien, Walaa F. Alsanie, Ahmed Gaber and Mostafa E. Elshobary
Sustainability **2021**, *13*(8), 4485; **https://doi.org/10.3390/su13084485** - 17 Apr 2021
Cited by 6 | Viewed by 502

Abstract This study aimed to understand the effect of commercial seaweed extract as a biofertilizer, named True-Algae-Max (TAM®), on the yield, nutritional, antioxidant, and cytotoxic activity of *Eruca vesicaria*. Three concentrations of TAM® (5, 10, and 15%) were studied by [...] Read more.
(This article belongs to the Special Issue Plant Biotic and Abiotic Stress Tolerance: Physiological and Molecular Approaches for Sustainable Agricultural Production)

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GIS Distance Learning during the COVID-19 Pandemic (Students' Perception)

by Jana Vojteková, Anna Tirpáková, Dalibor Gonda, Michaela Žoncová and Matej Vojtek
Sustainability **2021**, *13*(8), 4484; **https://doi.org/10.3390/su13084484** - 16 Apr 2021
Cited by 1 | Viewed by 763

Abstract The paper deals with distance learning of geographic information systems (GIS) at the Department of Geography and Regional Development FNS CPU in Nitra using various educational materials and the JitsiMeet application during the COVID-19 pandemic. Students of bachelor study had GIS lessons in [...] Read more.
(This article belongs to the Special Issue Sustainable Assessment in the Education System in the Age of COVID-19)

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Cocoyam [*Colocasia esculenta* (L.) Schott]: Exploring the Production, Health and Trade Potentials in Sub-Saharan Africa

by Olutosin A. Otekunrin, Barbara Sawicka, Abigail G. Adeyonu, Oluwaseun A. Otekunrin and Leszek Rachoń
Sustainability **2021**, *13*(8), 4483; **https://doi.org/10.3390/su13084483** - 16 Apr 2021
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Abstract Cocoyam [*Colocasia esculenta* (L.) Schott] also known as taro is regarded as an important staple crop in the Pacific Islands, Asia and Africa. But, Africa has been unpopular in the taro international market though it accounted for the highest share of the [...] Read more.
(This article belongs to the Special Issue Sustainability: Agricultural Production, Food Insecurity, and the Environment)

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Are Large Carnivores the Real Issue? Solutions for Improving Conflict Management through Stakeholder Participation

by Valeria Salvatori, Estelle Balian, Juan Carlos Blanco, Xavier Carbonell, Paolo Ciucci, László Demeter, Agnese Marino, Andrea Panzavolta, Andrea Sólyom, Yorck von Korff and Juliette Claire Young
Sustainability **2021**, *13*(8), 4482; **https://doi.org/10.3390/su13084482** - 16 Apr 2021
Cited by 4 | Viewed by 834

Abstract Social conflicts around large carnivores are increasing in Europe, often associated to the species expansion into human-modified and agricultural landscapes. Large carnivores can be seen as an added value by some but as a source of difficulties by others, depending on different values, [...] Read more.
(This article belongs to the Special Issue Social Sustainability and Social Learning)

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High Voltage Electric Discharge for Recovery of Chlorogenic Acid from Tobacco Waste

by Marija Banožić, Antun Jozinović, Jovana Grgić, Borislav Miličević and Stela Jokić
Sustainability **2021**, *13*(8), 4481; **https://doi.org/10.3390/su13084481** - 16 Apr 2021
Cited by 1 | Viewed by 479

Abstract Three fractions of tobacco waste (scrap, dust and midrib) were subjected to a high voltage electric discharge (HVED) assisted extraction procedure under different experimental conditions: solvent:solid ratio (300, 500, 700 mL/g), frequency (40, 70, 100 Hz) and treatment time (15, 30, 45 min), [...] Read more.
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Managing the Historical Agricultural Landscape in the Sicilian Anthropocene Context. The Landscape of the Valley of the Temples as a Time Capsule

by Angela Alessandra Badami
Sustainability **2021**, *13*(8), 4480; **https://doi.org/10.3390/su13084480** - 16 Apr 2021
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Abstract The debate over whether we are entering the Anthropocene Epoch focuses on the unequal consumption of the Earth system's resources at the expense of nature's regenerative abilities. To find a new point of balance with nature, it is useful to look back in [...] Read more.
(This article belongs to the Special Issue Historical Ecology and Landscape Archaeology: Cross-Disciplinary Approaches to the Long Anthropocene)

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A Metro-Based System as Sustainable Alternative for Urban Logistics in the Era of E-Commerce

by Rafael Villa and Andrés Monzón
Sustainability **2021**, *13*(8), 4479; **https://doi.org/10.3390/su13084479** - 16 Apr 2021
Cited by 1 | Viewed by 627

Abstract Business to consumer e-commerce (B2C) has increased sharply in recent years driven by a growing online population and changes in consumer behavior. In metropolitan areas, the "Amazon effect" (online retailers' vast selection, fast shipping, free returns, and low prices) has led to an [...] Read more.
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Analysis of Mudstone Fracture and Precursory Characteristics after Corrosion of Acidic Solution Based on Dissipative Strain Energy

by Xu Dong, Yu Wu, Kewang Cao, Naseer Muhammad Khan, Sajjad Hussain, Seungyeon Lee and Chuan Ma
Sustainability **2021**, *13*(8), 4478; **https://doi.org/10.3390/su13084478** - 16 Apr 2021
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Abstract The deformation and failure of rock materials are closely related to the strain energy characteristics during the loading process. These strain energy characteristics and rock properties are greatly affected when the rock is subjected to the acidic solution. To study the effects of [...] Read more.

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Moving Consumers along the Innovation Adoption Curve: A New Approach to Accelerate the Shift toward a More Sustainable Diet

by Antje Gonera, Erik Svanes, Annechen Bahr Bugge, Malin Myrset Hatlebakk, Katja-Maria Prexl and Øydis Ueland
Sustainability **2021**, *13*(8), 4477; **https://doi.org/10.3390/su13084477** - 16 Apr 2021
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Abstract Unsustainable food production and consumption contribute to greenhouse gas emissions and global warming. Adopting a more plant-based diet has been identified as a necessary change toward a more sustainable food system. In response to the call for transdisciplinary research on the sustainability of [...] Read more.
(This article belongs to the Section Sustainable Food)

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Wetland Biodiversity Disturbance Evaluation Induced by a Water Conservancy Project in the Flooded Plain of the Huolin River Lower Reaches

by Yujuan Zhai, Libo Hao, Yanhong Zhang, Ye Li and Zhaoli Liu
Sustainability **2021**, *13*(8), 4476; **https://doi.org/10.3390/su13084476** - 16 Apr 2021
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Abstract The Huolin River is an important water supply source for the wetland located in western Jilin province, especially the river flooding in the lower reaches of the basin. In recent years, the degree of aridity and salinization of the wetlands has increased. To [...] Read more.

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A Paradigm Shift in International Service-Learning: The Imperative for Reciprocal Learning

by Lynn Gregory, Kathleen Schroeder and Cynthia Wood
Sustainability **2021**, *13*(8), 4473; **https://doi.org/10.3390/su13084473** - 16 Apr 2021
Cited by 1 | Viewed by 406

Abstract The US-based authors argue that the practice of what we currently call "international service-learning" does not generally achieve its most important goals in the context of the global South, especially those based on the development of mutually beneficial relationships with host communities. The [...] Read more.
(This article belongs to the Special Issue Sustainability in Educational Travel and Environmental Protection)

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Can Market Reforms Curb the Expansion of Industrial Land?—Based on the Panel Data Analysis of Five National-Level Urban Agglomerations

by Wenfang Pu and Anlu Zhang
Sustainability **2021**, *13*(8), 4472; **https://doi.org/10.3390/su13084472** - 16 Apr 2021
Cited by 1 | Viewed by 418

Abstract As China entered marketization in the late 1980s, it soon established a market economy system and implemented tax-sharing reforms. Driven by the marketization, local governments have rapidly developed the economy under the pressure of fiscal competition caused by the reform of the tax-sharing [...] Read more.
(This article belongs to the Section Resources and Sustainable Utilization)

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Talent Management in Healthcare: A Systematic Qualitative Review

by Konstantinos D. Mitosis, Demetris Lamnisos and Michael A. Talias
Sustainability **2021**, *13*(8), 4469; **https://doi.org/10.3390/su13084469** - 16 Apr 2021
Cited by 2 | Viewed by 902

Abstract Talent Management (T.M.) constitutes a modern and emerging research area in Human Resources Management (HRM). Using a systematic literature approach, we searched in Talent Management literature in the healthcare sector context. We conclude that the number of related studies is minimal. The benefits [...] Read more.
(This article belongs to the Section Health and Sustainability)

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Perceived Stress and Cyberloafing among College Students: The Mediating Roles of Fatigue and Negative Coping Styles

by Yan Chen, Hong Chen, Frank Andrasik and Chuanhua Gu
Sustainability **2021**, *13*(8), 4468; **https://doi.org/10.3390/su13084468** - 16 Apr 2021
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Abstract Cyberloafing has increasingly attracted the attention of scholars because of the widespread use of digital devices in educational environments. This research was conducted to investigate the roles of fatigue and negative coping styles in mediating the relationship between perceived stress and cyberloafing. A [...] Read more.
(This article belongs to the Section Psychology of Sustainability and Sustainable Development)

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Differences in Local Rice Price Volatility, Climate, and Macroeconomic Determinants in the Indonesian Market

by Agie Wandala Putra, Jatna Supriatna, Raldi Hendro Koestoer and Tri Edhi Budhi Soesilo
Sustainability **2021**, *13*(8), 4465; **https://doi.org/10.3390/su13084465** - 16 Apr 2021
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Abstract Rice is a staple food in most Asian countries, and food security is often viewed as having a rice supply to avoid a food crisis. The large number of people who have low incomes means there is a risk of household economic conditions [...] Read more.
(This article belongs to the Section Sustainable Agriculture)

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The Dynamics of Public Perceptions and Climate Change in Swat Valley, Khyber Pakhtunkhwa, Pakistan

by Muhammad Suleman Bacha, Muhammad Muhammad, Zeyneb Kılıç and Muhammad Nafees
Sustainability **2021**, *13*(8), 4464; **https://doi.org/10.3390/su13084464** - 16 Apr 2021
Cited by 1 | Viewed by 513

Abstract With rising temperatures, developing countries are exposed to the horrors of climate change more than ever. The poor infrastructure and low adaptation capabilities of these nations are the prime concern of current studies. Pakistan is vulnerable to climate-induced hazards including floods, droughts, water [...] Read more.

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The Future of Post-Industrial Landscapes in East Lisbon: The Braço de Prata Neighbourhood

by Eser Yagci and Fernando Nunes da Silva
Sustainability **2021**, *13*(8), 4461; **https://doi.org/10.3390/su13084461** - 16 Apr 2021
Cited by 1 | Viewed by 395

Abstract East Lisbon is being exposed to large-scale urban regeneration processes, where luxury residential projects and mixed-use spatial developments are already underway. Thus, it is a living laboratory for "smart", "creative" and "green" projects, as well as related urban public space interventions. Braço de [...] Read more.
(This article belongs to the Special Issue Brownfields in Sustainable Urban and Rural System)

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Help-Seeking in an Academic Context: A Systematic Review

by Sergi Martín-Arbós, Elena Castarlenas and Jorge-Manuel Dueñas
Sustainability **2021**, *13*(8), 4460; **https://doi.org/10.3390/su13084460** - 16 Apr 2021
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Abstract Academic help-seeking as a learning strategy can influence academic achievement. Indeed, seeking help when needed is considered a self-regulated learning strategy that should be taken into account from the educational perspective. In this study, we review twenty-five articles published over the last 10 [...] Read more.
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Success Factors in Sustainable Management of IT Service Projects: Exploratory Factor Analysis

by Szymon Zaleski and Rafał Michalski
Sustainability **2021**, *13*(8), 4457; **https://doi.org/10.3390/su13084457** - 16 Apr 2021
Cited by 1 | Viewed by 558

Abstract Management of successful IT projects in a sustainable manner is influenced by numerous factors. Organizational awareness of the necessity of engaging all project stakeholders is an important issue that helps in meeting project sustainable development goals. While there are many studies on the [...] Read more.
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Spatial Planning and Climate Adaptation: Challenges of Land Protection in a Peri-Urban Area of the Mediterranean City of Thessaloniki

by Elisavet Thoidou

Sustainability **2021**, *13*(8), 4456; **https://doi.org/10.3390/su13084456** - 16 Apr 2021

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Abstract The growing interest in climate change and related risks has triggered efforts to address both its causes and impact. Climate action is mainstreamed in various public policies in which spatial planning has a key role and operates as a coordinating framework as well [...] Read more.

(This article belongs to the Special Issue Climate Actions from Theory to Practice: Nature Based Solutions and Adaptive Governance Models)

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Electroplating and PVD Finishing Technologies in the Fashion Industry: Perspectives and Scenarios

by Romeo Bandinelli, Virginia Fani and Bianca Bindi

Sustainability **2021**, *13*(8), 4453; **https://doi.org/10.3390/su13084453** - 16 Apr 2021

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Abstract This work deals with a comparison between electroplating and Physical Vapor Deposition (PVD) finishing technologies applied in the fashion industry, with a special focus on their environmental impacts. The goal of this work is to present and validate a Decision Support System (DSS) [...] Read more.

(This article belongs to the Special Issue Industrial Sustainability: Production Systems Design and Optimization across Sustainability)

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The Role of Flexibility in the Realization of Inclusive Education

by Laura Lübke, Martin Pinquart and Malte Schwinger

Sustainability **2021**, *13*(8), 4452; **https://doi.org/10.3390/su13084452** - 16 Apr 2021

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Abstract This study focused on associations between teachers' flexibility and their use of evidence-based strategies in inclusive education in a sample of N = 119 teachers. Flexibility showed direct effects on teachers' attitudes towards the achievement of mainstream students and students with learning difficulties, [...] Read more.

(This article belongs to the Special Issue ADHD and Related Problems in the Classroom: Perspectives for Sustainability)

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The Role of Water Depth Perception in Shaping Car Drivers' Intention to Enter Floodwaters: Experimental Evidence

by Katerina Papagiannaki, Michalis Diakakis, Vassiliki Kotroni, Kostas Lagouvardos and Giorgos Papagiannakis

Sustainability **2021**, *13*(8), 4451; **https://doi.org/10.3390/su13084451** - 16 Apr 2021

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Abstract Floods are one of the most lethal natural hazards. Recent studies show that in a large percentage of flood-related fatalities, victims engage in risk-taking behavior by getting deliberately in contact with floodwaters. This study integrates behavioral psychology and situational environmental factors with the [...] Read more.

(This article belongs to the Special Issue Climate-Related Hazards and Human Health: Mortality, Psychosocial Aspects, and Mitigation Policies)

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Postharvest Losses in Quantity and Quality of Table Grape (cv. Crimson Seedless) along the Supply Chain and Associated Economic, Environmental and Resource Impacts

by Anelle Blanckenberg, Umezuruike Linus Opara and Olaniyi Amos Fawole

Sustainability **2021**, *13*(8), 4450; **https://doi.org/10.3390/su13084450** - 16 Apr 2021

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Abstract High incidence of postharvest losses is a major challenge to global food security. Addressing postharvest losses is a better strategy to increase business efficiency and improve food security rather than simply investing more resources to increase production. Global estimates show that fruit and [...] Read more.

(This article belongs to the Special Issue Agricultural and Food Systems Sustainability: The Complex Challenge of Losses and Waste)

Developing a Hybrid Approach Based on Analytical and Metaheuristic Optimization Algorithms for the Optimization of Renewable DG Allocation Considering Various Types of Loads

by Amal A. Mohamed, Salah Kamel, Ali Selim, Tahir Khurshaid and Sang-Bong Rhee
Sustainability **2021**, *13*(8), 4447; **https://doi.org/10.3390/su13084447** - 16 Apr 2021
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Abstract The optimal location of renewable distributed generations (DGs) into a radial distribution system (RDS) has attracted major concerns from power system researchers in the present years. The main target of DG integration is to improve the overall system performance by minimizing power losses [...] Read more.
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Predict and Simulate Sustainable Urban Growth by Using GIS and MCE Based CA. Case of Famagusta in Northern Cyprus

by Can Kara and Naciye Doratlı
Sustainability **2021**, *13*(8), 4446; **https://doi.org/10.3390/su13084446** - 16 Apr 2021
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Abstract The research study utilizes Multi Criteria Evaluation (MCE) method in geographic information systems (GIS) environment and uses MCE suitability maps with Cellular Automata (CA) for predicting and simulating sustainable urban development scenarios in Famagusta City. It represents first scenario-based simulations of the future [...] Read more.
(This article belongs to the Special Issue Using Geospatial Technologies for Sustainable Urban Development)

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Route Selection Decision-Making in an Intermodal Transport Network Using Game Theory

by Lucija Bukvić, Jasmina Pašagić Škrinjar, Borna Abramović and Vladislav Zitrický
Sustainability **2021**, *13*(8), 4443; **https://doi.org/10.3390/su13084443** - 15 Apr 2021
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Abstract Traveling through a transport network, or ordering and delivering packets, involves fundamental decision-making processes which can be approached by game theory: Rather than simply choosing a route, individuals need to evaluate routes in the presence of the congestion resulting from the decisions made [...] Read more.
(This article belongs to the Special Issue Sustainable Freight Transportation System)

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Basic Education Students' Digital Competence in the Area of Communication: The Influence of Online Communication and the Use of Social Networks

by Marcos Cabezas-González, Sonia Casillas-Martín and Ana García-Valcárcel Muñoz-Repiso
Sustainability **2021**, *13*(8), 4442; **https://doi.org/10.3390/su13084442** - 15 Apr 2021
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Abstract The global public health crisis unleashed by the COVID-19 pandemic has made it clear that digital competence in education is no longer an option, but a necessity. Online communication with friends using social networks is an activity in which young people very frequently [...] Read more.
(This article belongs to the Special Issue Digital Teaching Competences for Sustainable Development)

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The Effect Mechanism of Tie Strength of Supply Networks on Risk Sharing: Based on the Empirical Data of China's Automobile Manufacturing Industry

by Lina Ma, Min Wan and Yushen Du
Sustainability **2021**, *13*(8), 4439; **https://doi.org/10.3390/su13084439** - 15 Apr 2021
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Abstract Based on the research perspective of the cooperation risk and opportunistic risk between supply network enterprises, this article investigates the mechanism of how tie strength between manufacturers and suppliers influences risk sharing among enterprises from two dimensions of tie strength: structural strength and [...] Read more.
(This article belongs to the Section Economic and Business Aspects of Sustainability)

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Innovative Building Technology Implemented into Facades with Active Thermal Protection

by Daniel Kalús, Jozef Gašparík, Peter Janík, Matej Kubica and Patrik Šťastný
Sustainability **2021**, *13*(8), 4438; **https://doi.org/10.3390/su13084438** - 15 Apr 2021
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Abstract The article focuses on the description of an innovative solution and application of active thermal protection of buildings using thermal insulation panels with active regulation of heat transfer in the form of a contact insulation system. The thermal insulation panels are part of [...] Read more.
(This article belongs to the Special Issue Construction Technology and Management in the Context of Economical and Environmental Sustainability)

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Improving Energy Efficiency in Buildings Using an Interactive Mathematical Programming Approach

by Christina Diakaki and Evangelos Grigoroudis
Sustainability **2021**, *13*(8), 4436; **https://doi.org/10.3390/su13084436** - 15 Apr 2021
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Abstract Improving energy efficiency in buildings is a major priority and challenge worldwide. The employed measures vary in nature, and the decision analyst, who is typically the architect, the engineer, or the building expert that has undertaken the task to suggest energy efficient solutions, [...] Read more.
(This article belongs to the Special Issue Energy Transition and Climate Change in Decision-making Processes)

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Framing Sustainability. Evidence from Participatory Forums to Taylor the Regional 2030 Agenda to Local Contexts

by Maria Stella Righettini
Sustainability **2021**, *13*(8), 4435; **https://doi.org/10.3390/su13084435** - 15 Apr 2021
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Abstract The present article introduces an original theoretical framework to investigate how public participation reframes governmental sustainability topics along four dimensions: exploration, prioritization, embedding, and integration. The literature highlights public participation as a strategic sustainability governance tool that can help governments extract local communities' [...] Read more.
(This article belongs to the Special Issue Energy for the Future: Participatory and Multidisciplinary Approaches to Sustainable Post-carbon Cities and Societies)

Production in Ratanakiri Province of Cambodia

by Raby Nget, Edna A. Aguilar, Pompe C. Sta. Cruz, Consorcia E. Reaño, Pearl B. Sanchez, Manuel R. Reyes and P. V. Vara Prasad
Sustainability **2021**, *13*(8), 4433; **https://doi.org/10.3390/su13084433** - 15 Apr 2021
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Abstract A study was undertaken in Koun Mom district of Ratanakiri province in Cambodia to analyze the perceptions of the current status and constraints to soybean production and identify solutions to improve production and the management practices. Primary data were collected by personal interviews [...] Read more.
(This article belongs to the Special Issue Sustainable Development from the Management and Social Science Perspective)

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Nature Tourism on the Colombian—Ecuadorian Amazonian Border: History, Current Situation, and Challenges

by Carlos Mestanza-Ramón and José Luis Jiménez-Caballero
Sustainability **2021**, *13*(8), 4432; **https://doi.org/10.3390/su13084432** - 15 Apr 2021
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Abstract Global conflicts can severely affect a nation's tourism activities. Tourism can also be seriously affected by health problems such as epidemics or pandemics. It is important to establish strategies to be prepared for adverse situations. The objective of this study focused on analyzing [...] Read more.
(This article belongs to the Special Issue Challenges and Innovations in Sustainable and Community-Based Tourism)

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The Emergence of Service Robots at Restaurants: Integrating Trust, Perceived Risk, and Satisfaction

by Kyung Hwa Seo and Jee Hye Lee
Sustainability **2021**, *13*(8), 4431; **https://doi.org/10.3390/su13084431** - 15 Apr 2021
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Abstract As various types of robots increasingly influence consumers' service experiences, companies need to consider how to be competitive in this new artificial intelligence and service automation business environment. However, only limited studies have investigated the factors involved in consumer behaviors toward robot restaurant [...] Read more.

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Dynamic Route Flow Estimation in Road Networks Using Data from Automatic Number of Plate Recognition Sensors

by Santos Sánchez-Cambronero, Fernando Álvarez-Bazo, Ana Rivas and Inmaculada Gallego
Sustainability **2021**, *13*(8), 4430; **https://doi.org/10.3390/su13084430** - 15 Apr 2021
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Abstract The traffic flow on road networks is dynamic in nature. Hence, a model for dynamic traffic flow estimation should be a very useful tool for administrations to make decisions aimed at better management of traffic. In fact, these decisions may in turn improve [...] Read more.
(This article belongs to the Special Issue Highway Models and Sustainability)

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Valorized Food Processing By-Products in the EU: Finding the Balance between Safety, Nutrition, and Sustainability

by Madhura Rao, Aalt Bast and Alie de Boer
Sustainability **2021**, *13*(8), 4428; **https://doi.org/10.3390/su13084428** - 15 Apr 2021
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Abstract Food businesses in the European Union are preparing for a carbon-neutral future by gradually transitioning to a circular way of operating. Building upon results from the EU REFRESH project, we consider the most valuable food processing by-streams in Europe and discuss potential food [...] Read more.
(This article belongs to the Special Issue Safety and Quality of Sustainable Food)

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Antecedents of the Green Behavioral Intentions of Hotel Guests: A Developing Country Perspective

by Farida Saleem
Sustainability **2021**, *13*(8), 4427; **https://doi.org/10.3390/su13084427** - 15 Apr 2021
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Abstract The current study sought to extend the literature on antecedents of the green behavioral intentions of hotel guests in a developing country context. Building on the theory of planned behavior and moral norm-activation theory, antecedents of the green behavioral intentions of hotel guests [...] Read more.
(This article belongs to the Special Issue Why Should We Go Green? Motivations and Constraints of Green Consumption in the Hospitality and Tourism Industry)

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Does a Manager Respond to a Going-Concern Audit Opinion with an Asymmetry in Gain and Loss?

by Taewoo Kim
Sustainability **2021**, *13*(8), 4425; **https://doi.org/10.3390/su13084425** - 15 Apr 2021
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Abstract In this paper, I investigate the relationship between previous going-concern audit opinions and subsequent asymmetric timeliness in accounting. Using the time-series and price-based models and conservatism proxy, I find that firms with going-concern audit opinions subsequently report losses in a more timely manner [...] Read more.
(This article belongs to the Section Economic and Business Aspects of Sustainability)

Determinants of Sustainable Waste Management Behavior of Malaysian Academics

by Gangga Muniandy, Marhana Mohamed Anuar, Bob Foster, Jumadil Saputra, Muhamad Deni Johansyah, Tran Tien Khoa and Zafar U. Ahmed
Sustainability **2021**, *13*(8), 4424; **https://doi.org/10.3390/su13084424** - 15 Apr 2021
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Abstract The global increase of urban solid waste in developing countries is creating highly significant challenges. There is a lack of research on sustainable waste management behavior (SWMB) among university academic staff. Hence, this study aims to examine the effect of attitude, subjective norm, [...] Read more.
(This article belongs to the Special Issue Social and New Technology Challenges of Sustainable Business II)

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Impacts of Tourism Development on Coastal Communities in Cha-am Beach, the Gulf of Thailand, through Analysis of Local Perceptions

by Sussaangana Unhasuta, Nophea Sasaki and Sohee Minsun Kim
Sustainability **2021**, *13*(8), 4423; **https://doi.org/10.3390/su13084423** - 15 Apr 2021
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Abstract Coastal tourism development can appropriately contribute to the livelihood of the community. To date, few studies have been conducted on the impacts of tourism development on the coastal communities in Thailand. This study assessed these impacts through the analysis of local perceptions based [...] Read more.
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Tailoring Next Generation Plant Growth Promoting Microorganisms as Versatile Tools beyond Soil Desalinization: A Road Map towards Field Application

by Hafsa Cherif-Silini, Allaoua Silini, Ali Chenari Bouket, Faizah N. Alenezi, Lenka Luptakova, Nawel Bouremani, Justyna Anna Nowakowska, Tomasz Oszako and Lassaad Belbahri
Sustainability **2021**, *13*(8), 4422; **https://doi.org/10.3390/su13084422** - 15 Apr 2021
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Abstract Plant growth promoting bacteria (PGPB) have been the target of intensive research studies toward their efficient use in the field as biofertilizers, biocontrol, and bioremediation agents among numerous other applications. Recent trends in the field of PGPB research led to the development of [...] Read more.
(This article belongs to the Special Issue Drought and Salinity Tolerance in Crops for Sustainable Agriculture)

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Examining the Use of Serious Games for Enhancing Community Resilience to Climate Risks in Thailand

by Wijitbusaba Marome, Boonanan Natakun and Diane Archer
Sustainability **2021**, *13*(8), 4420; **https://doi.org/10.3390/su13084420** - 15 Apr 2021
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Abstract This paper presents the 'Kin Dee You Dee' (Thai for 'Eat well, live well') toolkit, which comprises three sets of serious games aimed at facilitating discussions and transformative learning on resilience to urban low-income communities. The first stage of the toolkit creates awareness [...] Read more.
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by Chiara Gruden, Irena Ištoka Otković and Matjaž Šraml
Sustainability **2021**, *13*(8), 4419; **https://doi.org/10.3390/su13084419** - 15 Apr 2021
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Abstract Smartphones have become an integral part of our everyday lives and keep us busy while doing other primary activities such as driving, cycling or walking in traffic. The problem of digital distraction among drivers has been largely addressed, and interest is growing also [...] Read more.
(This article belongs to the Special Issue Innovative Approaches in Children Traffic Safety)

Industrial Structure Optimization and Low-Carbon Transformation of Chinese Industry Based on the Forcing Mechanism of CO_2 Emission Peak Target

by Feng Wang, Changhai Gao, Wulin Zhang and Danwen Huang
Sustainability **2021**, *13*(8), 4417; **https://doi.org/10.3390/su13084417** - 15 Apr 2021
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Abstract The setting of a CO_2 emission peak target (CEPT) will have a profound impact on Chinese industry. An objective assessment of this impact is of great significance, both for understanding/applying the forcing mechanism of CEPT, and for promoting the optimization of China's [...] Read more.
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Parametric Study on Residential Passive House Building in Different Chinese Climate Zones

by Xing Li, Qinli Deng, Zhigang Ren, Xiaofang Shan and Guang Yang
Sustainability **2021**, *13*(8), 4416; **https://doi.org/10.3390/su13084416** - 15 Apr 2021
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Abstract With the increasing of building energy consumptions, the related issues of energy crisis and environmental pollution become more and more prominent. As an effective energy-saving technology, the passive house (PH) has been widely applied in China to reduce the building energy utilization. However, [...] Read more.
(This article belongs to the Special Issue Advances in Research and Sustainable Applications of Energy—Related Occupant Behavior in Buildings)

Basic Courses of Design Major Based on the ADDIE Model: Shed Light on Response to Social Trends and Needs

by Jui-Che Tu, Xu Zhang and Xiu-Yue Zhang
Sustainability **2021**, *13*(8), 4414; **https://doi.org/10.3390/su13084414** - 15 Apr 2021
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Abstract Social innovation leads to more diverse methods for design education, which helps design education response to social trends and needs. Social change has brought about the transformation of teaching objects for design education courses, which can provide the public with more opportunities to [...] Read more.
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Introduction: FDI and Institutional Quality: New Insights and Future Perspectives from Emerging and Advanced Economies

by Alfredo Jimenez, Jeoung Yul Lee and Xavier Ordeñana
Sustainability **2021**, *13*(8), 4413; **https://doi.org/10.3390/su13084413** - 15 Apr 2021
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Abstract The influence of institutional quality on the economic environment has been long acknowledged by researchers, notably as a main driver of Foreign Direct Investment (FDI) [...] Full article
(This article belongs to the Special Issue FDI and Institutional Quality: New Insights and Future Perspectives from Emerging and Advanced Economies)

Life Cycle Cost Analysis Comparison of Hot Mix Asphalt and Reclaimed Asphalt Pavement: A Case Study

by Waqas Rafiq, Muhammad Ali Musarat, Muhammad Altaf, Madzlan Napiah, Muslich Hartadi Sutanto, Wesam Salah Alaloul, Muhammad Faisal Javed and Amir Mosavi
Sustainability **2021**, *13*(8), 4411; **https://doi.org/10.3390/su13084411** - 15 Apr 2021
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Abstract In the construction and maintenance of asphalt pavement, reclaimed asphalt pavement (RAP) is being widely used as a cheaper alternative to the conventional hot mix asphalt (HMA). HMA incorporated with a high RAP content (e.g., 40%), which is the most commonly used, may [...] Read more.

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Market Foods, Own Production, and the Social Economy: How Food Acquisition Sources Influence Nutrient Intake among Ecuadorian Farmers and the Role of Agroecology in Supporting Healthy Diets

by Ana Deaconu, Peter R. Berti, Donald C. Cole, Geneviève Mercille and Malek Batal
Sustainability **2021**, *13*(8), 4410; **https://doi.org/10.3390/su13084410** - 15 Apr 2021
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Abstract Rural Ecuadorians are experiencing a double burden of malnutrition, characterized by simultaneous nutrient inadequacies and excesses, alongside the social and environmental consequences of unsustainable agriculture. Agriculture can support farmer nutrition by providing income for market purchases and through the consumption of foods from [...] Read more.
(This article belongs to the Special Issue Diet, Human Health and Wellbeing in Traditional Food Systems)

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Visualizing Sustainable Supply Chain Management: A Systematic Scientometric Review

by Zhiwen Su, Mingyu Zhang and Wenbing Wu
Sustainability **2021**, *13*(8), 4409; **https://doi.org/10.3390/su13084409** - 15 Apr 2021
Cited by 3 | Viewed by 929

Abstract Sustainable supply chain management (SSCM) has been attracting extensive attention from both practitioners and scholars. The main objective of this paper is to visualize and conduct a systematic scientometric review on 9151 articles and reviews published from 2007 to 2021. Research techniques of [...] Read more.
(This article belongs to the Special Issue Sustainable Supply Chain Innovation and Operation Management)

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Does One Decade of Urban Policy for the Shrinking City Make Visible Progress in Urban Re-Urbanization? A Case Study of Bytom, Poland

by Iwona Kantor-Pietraga
Sustainability **2021**, *13*(8), 4408; **https://doi.org/10.3390/su13084408** - 15 Apr 2021
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Abstract Planning and managing the declining fortunes of shrinking cities are essential in shaping urban policy in post-industrial urban societies, especially in Central and Eastern European states. Many studies emphasize city management and redevelopment as important policy constituencies for driving revitalization. However, there is [...] Read more.
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Heterogeneous Shareholders' Participation, COVID-19 Impact, and Innovation Decisions of State-Owned Firms: Evidence from China

by Rui Wang, Sheng Ma, Xinxin Xu and Pan Song
Sustainability **2021**, *13*(8), 4406; **https://doi.org/10.3390/su13084406** - 15 Apr 2021
Cited by 1 | Viewed by 522

Abstract Innovation ability has become an important factor affecting the global competitiveness and sustainable development of state-owned enterprises (SOEs) in China, particularly during the COVID-19 period. This study examined the association between heterogeneous shareholders and SOE innovation, in addition to the moderating impact of [...] Read more.
(This article belongs to the Special Issue Business Strategy and Decision-Making under COVID-19: Lessons Learned)

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Energy Treatment of Solid Municipal Waste in Combination with Biomass by Decentralized Method with the Respect to the Negative Effects on the Environment

by Miroslav Rimar, Olha Kulikova, Andrii Kulikov and Marcel Fedak
Sustainability **2021**, *13*(8), 4405; **https://doi.org/10.3390/su13084405** - 15 Apr 2021
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Abstract Waste is a product of society and one of the biggest challenges for future generations is to understand how to sustainably dispose of large amounts of waste. The main objective of this study was to determine the possibility and conditions of the decentralized [...] Read more.

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Sustainable Urban Mobility Plan and Health Security

by Ilenia Spadaro and Francesca Pirlone
Sustainability **2021**, *13*(8), 4403; **https://doi.org/10.3390/su13084403** - 15 Apr 2021
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Abstract The topic of sustainable mobility is now a priority at the urban level. Today's cities are often very busy, polluted, and dangerous. Therefore, to encourage sustainable mobility is important; it brings territorial development, environment, health, society, and economy benefits. The corona virus disease-19 [...] Read more.
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Open Access Editor's Choice Article

An Approach to the Operation Modes and Strategies for Integrated Hybrid Parabolic Trough and Photovoltaic Solar Systems

by José A. López-Álvarez, Miguel Larrañeta, Elena Pérez-Aparicio, Manuel A. Silva-Pérez and Isidoro Lillo-Bravo
Sustainability **2021**, *13*(8), 4402; **https://doi.org/10.3390/su13084402** - 15 Apr 2021
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Abstract Concentrated solar power (CSP) and photovoltaic (PV) solar systems can be hybridized, creating synergies: on one hand procuring dispatchability by storing thermal energy, and on the other hand generating electricity at a highly competitive prize. In this paper, we present an approach to [...] Read more.
(This article belongs to the Special Issue Solar Power System and Sustainability)

Corruption in Construction Projects: Bibliometric Analysis of Global Research

by Zhao Zhai, Ming Shan, Amos Darko and Albert P. C. Chan
Sustainability **2021**, *13*(8), 4400; **https://doi.org/10.3390/su13084400** - 15 Apr 2021
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Abstract Corruption has been identified as a major problem in construction projects. It can jeopardize the success of these projects. Consequently, corruption has garnered significant attention in the construction industry over the past two decades, and several studies on corruption in construction projects (CICP) [...] Read more.
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Understanding Public Intentions to Participate in Protection Initiatives for Forested Watershed Areas Using the Theory of Planned Behavior: A Case Study of Cameron Highlands in Pahang, Malaysia

by Arlixcya Vinnisa Anak Empidi and Diana Emang
Sustainability **2021**, *13*(8), 4399; **https://doi.org/10.3390/su13084399** - 15 Apr 2021
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Abstract The heavy emphasis on land-use changes to meet the needs for gross domestic product growth often causes deforestation, affecting forests' capability to function as watershed areas properly. While land-use changes generate socioeconomics success, they also lead to environmental deterioration that puts public welfare [...] Read more.
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Compaction Procedures and Associated Environmental Impacts Analysis for Application of Steel Slag in Road Base Layer

by Bo Gao, Chao Yang, Yingxue Zou, Fusong Wang, Xiaojun Zhou, Diego Maria Barbieri and Shaopeng Wu
Sustainability **2021**, *13*(8), 4396; **https://doi.org/10.3390/su13084396** - 15 Apr 2021
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Abstract In recent years, recycling steel slag is receiving growing interest in the road base layer construction field due to its role in alleviating land occupation and resource shortages. However, the mixture compaction and its environmental impact on practical construction sites remain unclear, which [...] Read more.
(This article belongs to the Special Issue Recycled Materials and Infrastructure Sustainability)

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Smart Products Enable Smart Regulations—Optimal Durability Requirements Facilitated by the IoT

by Moritz-C. Schlegel, Claudia Koch, Mona Mirtsch and Andrea Harrer
Sustainability **2021**, *13*(8), 4395; **https://doi.org/10.3390/su13084395** - 15 Apr 2021
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Abstract The challenges and opportunities linked with IoT have been intensively discussed in recent years. The connectivity of things over their entire life cycle and the smart properties associated with it provide new functionalities and unprecedented availability of (usage) data. This offers huge opportunities [...] Read more.
(This article belongs to the Special Issue Circular Economy, Innovation and Quality Infrastructure)

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Analysis of the Impacts of Economic Growth Targets and Marketization on Energy Efficiency: Evidence from China

by Xufeng Su, Xiaodong Yang, Jinning Zhang, Jinling Yan, Junfeng Zhao, Jianliang Shen and Qiying Ran
Sustainability **2021**, *13*(8), 4393; **https://doi.org/10.3390/su13084393** - 15 Apr 2021
Cited by 1 | Viewed by 504

Abstract OEnergy efficiency is a vital factor to promote sustainable development. In this paper, the directional distance function–global Malmquist–Luenberger model (DDF-GML) is applied to measure the energy efficiency levels of 30 provinces in China from 2000 to 2017. Simultaneously, the impacts of the economic [...] Read more.
(This article belongs to the Special Issue Energy Economy Aspect of Sustainability)

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E-Commerce in the Retail Chain Store Market: An Alternative or a Main Trend?

by Christina Kleisiari, Marie-Noelle Duquenne and George Vlontzos
Sustainability **2021**, *13*(8), 4392; **https://doi.org/10.3390/su13084392** - 15 Apr 2021
Cited by 2 | Viewed by 891

Abstract The purpose of this research is to assess the impact of important aspects leading to the further development of e-trade in the retail market and to identify the rationale behind consumer preferences. The degree of total service (adequacy of staff, reception) and the [...] Read more.
(This article belongs to the Special Issue Sustainable Farm and Food Business Models under Digitalisation)

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Characterizations of Gelatin from the Skin of American Bullfrog (*Rana catesbeiana*) as Affected by Extraction Temperature

by Weibo Zhang, Chong Chen, Ziyu Huang and Pengjie Wang
Sustainability **2021**, *13*(8), 4390; **https://doi.org/10.3390/su13084390** - 15 Apr 2021
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Abstract We investigated the effect of extraction temperature on the gel properties of gelatin from the skin of the American bullfrog (*Rana catesbeiana*) and the mechanisms. The textural and rheological properties of bullfrog gelatin extracted at 45 °C (G45), 55 °C (G55), [...] Read more.
(This article belongs to the Special Issue Natural Products and Sustainable Bioresource Recovery)

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Neuro-Competence Approach for Sustainable Engineering

by Susana Suarez-Fernandez de Miranda, Francisco Aguayo-González, María Jesús Ávila-Gutiérrez and Antonio Córdoba-Roldán
Sustainability **2021**, *13*(8), 4389; https://doi.org/10.3390/su13084389 - 15 Apr 2021
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Abstract Manufacturing systems under Industry 4.0, and their transition towards Industry 5.0, take into account the Quintuple Helix innovation model, associated with the sustainable development goals (SDGs) set by the UN and Horizon 2030, in which companies focus on operational efficiency in terms of [...] Read more.
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Small and Medium-Sized Ports in the TEN-T Network and Nexus of Europe's Twin Transition: The Way towards Sustainable and Digital Port Service Ecosystems

by Laima Gerlitz and Christopher Meyer
Sustainability **2021**, *13*(8), 4386; **https://doi.org/10.3390/su13084386** - 14 Apr 2021
Cited by 2 | Viewed by 589

Abstract Despite high competition among big EU ports, such as Rotterdam, Hamburg, or Valencia, acting as Core Ports in the Trans-European Transport Core and Comprehensive Network (TEN-T), this paper addresses the marginalized decision-making capability for environmental and digital transition immanent in the Small and [...] Read more.
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Local Community Experience as an Anchor Sustaining Reorientation Processes during COVID-19 Pandemic

by Flora Gatti and Fortuna Procentese
Sustainability **2021**, *13*(8), 4385; **https://doi.org/10.3390/su13084385** - 14 Apr 2021
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Abstract In recent months, Italian citizens have alternatively experienced a forced, total or partial, loss of their opportunities to go out and meet their social network or their reduction, according to the restrictions locally needed to contain the spread of the COVID-19 outbreak. The [...] Read more.
(This article belongs to the Special Issue Pandemic and the City: Urban Issues in the Context of COVID-19)

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New Mobility Paradigm and Indigenous Construction of Places: Physical and Symbolic Mobility of Aymara Groups in the Urbanization Process, Chile

by Gonzalo Salazar and Paloma González
Sustainability **2021**, *13*(8), 4382; **https://doi.org/10.3390/su13084382** - 14 Apr 2021
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Abstract In the current global scenario, in which mobility has been strongly impacted, it is relevant to highlight certain mobility experiences of Indigenous Latin American peoples, in which new cultural and geographical elements justify revisiting this phenomenon. In this context, the mobility of the [...] Read more.
(This article belongs to the Special Issue Using Geospatial Technologies for Sustainable Urban Development)

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E-Learning vs. Face-To-Face Learning: Analyzing Students' Preferences and Behaviors

by Vasile Gherheș, Claudia E. Stoian, Marcela Alina Fărcașiu and Miroslav Stanici
Sustainability **2021**, *13*(8), 4381; **https://doi.org/10.3390/su13084381** - 14 Apr 2021
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Abstract Educational life worldwide has been shaken by the closure of schools due to the outbreak of the coronavirus pandemic. The ripple effects have been felt in the way both teachers and students have adapted to the constraints imposed by the new online form [...] Read more.
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Smart Collaborative Performance-Induced Parameter Identification Algorithms for Synchronous Reluctance Machine Magnetic Model

by Linjie Ren, Guobin Lin, Yuanzhe Zhao and Zhiming Liao
Sustainability **2021**, *13*(8), 4379; **https://doi.org/10.3390/su13084379** - 14 Apr 2021
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Abstract In rail transit traction, due to the remarkable energy-saving and low-cost characteristics, synchronous reluctance motors (SynRM) may be a potential substitute for traditional AC motors. However, in the parameter extraction of SynRM nonlinear magnetic model, the accuracy and robustness of the metaheuristic algorithm [...] Read more.
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Material Flow Analysis to Evaluate Supply Chain Evolution and Management: An Example Focused on Maritime Pine in the Landes de Gascogne Forest, France

by Rory J. Layton, Rachel Horta Arduin, Haji Yazdeen, Regis Pommier and Guido Sonnemann
Sustainability **2021**, *13*(8), 4378; **https://doi.org/10.3390/su13084378** - 14 Apr 2021
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Abstract The Landes de Gascogne forest, located in southwestern France, spans nearly 10,000 km^2 and consists largely of maritime pine (*Pinus pinaster*). This forest in unique to Europe because it is almost entirely created and managed by man for specific industries. [...] Read more.
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The Role of Environmental Attitudes in Explaining Public Perceptions of Climate Change and Renewable Energy Technologies in Lithuania

by Aistė Balžekienė and Agnė Budžytė
Sustainability **2021**, *13*(8), 4376; **https://doi.org/10.3390/su13084376** - 14 Apr 2021
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Abstract The Baltic states in general and Lithuania in particular represent a controversial combination of rapidly increasing climate change impacts and moderate or low concern with the climate crisis. A value shift is essential for the societal support and acceptance of renewable energy solutions. [...] Read more.
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The Virtual Online Supermarket: An Open-Source Research Platform for Experimental Consumer Research

by Nils Engelbrecht, Tim-Benjamin Lembcke, Alfred Benedikt Brendel, Kilian Bizer and Lutz M. Kolbe
Sustainability **2021**, *13*(8), 4375; **https://doi.org/10.3390/su13084375** - 14 Apr 2021
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Abstract It is controversially discussed if and which interventions policymakers should implement to promote healthier, more sustainable, and more ethical food choices. Often, policy measures suffer from a lack of data. This is especially true for the growing field of online grocery shopping. Yet, [...] Read more.
(This article belongs to the Collection Food Choice and Consumer Preferences)

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Social Evaluation of Public Open Space Services and Their Impact on Well-Being: A Micro-Scale Assessment from a Coastal University

by Abdullah Addas and Ahmad Maghrabi
Sustainability **2021**, *13*(8), 4372; **https://doi.org/10.3390/su13084372** - 14 Apr 2021
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Abstract Public open spaces services have been shown to be profoundly affected by rapid urbanization and environmental changes, and in turn, they have influenced socio-cultural relationships and human well-being. However, the impact of these changes on public open space services (POSS) remains unexplored, particularly [...] Read more.
(This article belongs to the Section Sustainable Urban and Rural Development)

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Sustainability of Energy-Induced Growth Nexus in Brazil: Do Carbon Emissions and Urbanization Matter?

by Tomiwa Sunday Adebayo, Abraham Ayobamiji Awosusi, Jamiu Adetola Odugbesan, Gbenga Daniel Akinsola, Wing-Keung Wong and Husam Rjoub
Sustainability **2021**, *13*(8), 4371; **https://doi.org/10.3390/su13084371** - 14 Apr 2021
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Abstract This study assesses the relationship between economic performance and environmental sustainability by taking into account the role of energy consumption, urbanization, and trade openness in Brazil by using data spanning from 1965 to 2019. The study is distinct from previously documented studies in [...] Read more.
(This article belongs to the Special Issue Reviews, Advances and Applications in Environmental Sustainability)

I Want to Participate—Communities of Practice in Foraging and Gardening Projects as a Contribution to Social and Cultural Sustainability in Early Childhood Education

by Veronica Bergan, Inger Wallem Krempig, Tove Aagnes Utsi and Kari Wallem Bøe
Sustainability **2021**, *13*(8), 4368; **https://doi.org/10.3390/su13084368** - 14 Apr 2021
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Abstract Learning and development in early childhood is highly dependent on social interaction and exploration through continuous encounters with the real world. Foraging and gardening are outdoor pedagogical practices that have relevance to education for sustainability. Previous work suggests that engagement in such activities [...] Read more.
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Ectomycorrhizal Fungi Associated with *Pinus densiflora* Seedlings under Flooding Stress

by Yoonhee Cho, Shinnam Yoo, Myung Soo Park, Ji Seon Kim, Chang Sun Kim and Young Woon Lim
Sustainability **2021**, *13*(8), 4367; **https://doi.org/10.3390/su13084367** - 14 Apr 2021
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Abstract Flooding is an environmental stress for plants that not only limits aeration and nutrient acquisition, but also disturbs underground plant-associated fungal communities. Despite frequent flooding, red pine (*Pinus densiflora*) seedlings thrive in streamside environments. However, whether the compatible ectomycorrhizal fungi (EMF) [...] Read more.
(This article belongs to the Section Sustainability, Biodiversity and Conservation)

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The Role of Anthropomorphic Messengers in Sustainable Participatory Corporate Social Responsibility: Focusing on Messenger's Facial Expression and Participation Effort

by Yunjeong Ahn and Jieun Lee
Sustainability **2021**, *13*(8), 4365; **https://doi.org/10.3390/su13084365** - 14 Apr 2021
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Abstract This study examines the role of participation effort, focusing on the effect of anthropomorphic messengers' facial expression on consumers' perception in the context of corporate social responsibility (CSR). CSR activities requiring consumer participation can elicit their positive responses. Although companies' interests in participatory [...] Read more.
(This article belongs to the Section Economic and Business Aspects of Sustainability)

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Coping with Loss Aversion and Risk Management in the Supply Chain Coordination

by Wei Liu, Han Zhao, Shiji Song, Wenxuan He and Xiaochen Li
Sustainability **2021**, *13*(8), 4364; **https://doi.org/10.3390/su13084364** - 14 Apr 2021
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Abstract In this paper, we apply a combined revenue sharing and buyback contract to investigate the channel coordination of a two-echelon supply chain with a loss-averse retailer. Since loss-averse decision makers usually take on more risks, the Conditional Value-at-Risk (CVaR) measure is introduced to [...] Read more.
(This article belongs to the Special Issue Supply Chain Management for Sustainable Development)

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Collective Responsibility in the Cooperative Governance of Climate Change

by Alessandro Piazza
Sustainability **2021**, *13*(8), 4363; **https://doi.org/10.3390/su13084363** - 14 Apr 2021
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Abstract This paper sets out a proposal for framing collective responsibility as a central element within the cooperative governance of climate change. It begins by reconstructing the analysis of climate change as a Tragedy of the Commons in the economic literature and as a [...] Read more.
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Implementing Horizontal Cooperation in Public Transport and Parcel Deliveries: The Cooperative Share-A-Ride Problem

by Rossana Cavagnini and Valentina Morandi
Sustainability **2021**, *13*(8), 4362; **https://doi.org/10.3390/su13084362** - 14 Apr 2021
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Abstract The static share-a-ride problem (SARP) consists of handling people and parcels in an integrated way through the same vehicle, which provides a shared trip between an origin and a destination, in response to requests received in advance. When multiple providers compete on the [...] Read more.
(This article belongs to the Special Issue Sustainability in Synchromodal Logistics and Transportation)

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Linking Entrepreneurial Orientation with Innovation Performance in SMEs; the Role of Organizational Commitment and Transformational Leadership Using Smart PLS-SEM

by Shuja Iqbal, José Moleiro Martins, Mário Nuno Mata, Shumaila Naz, Shamim Akhtar and António Abreu
Sustainability **2021**, *13*(8), 4361; **https://doi.org/10.3390/su13084361** - 14 Apr 2021
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Abstract Entrepreneurial orientation has become an enormously significant construct in the innovation studies literature. Predominantly for SMEs, its role has been widely recognized in almost all regional contexts across the globe. The present study is aimed at investigating the effects of entrepreneurial orientation, transformational [...] Read more.
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An Institutional Analysis and Reconfiguration Framework for Sustainability Research on Post-Transition Forestry—A Focus on Ukraine

by Maria Nijnik, Tatiana Kluvánková, Mariana Melnykovych, Albert Nijnik, Serhiy Kopiy, Stanislava Brnkaľáková, Simo Sarkki, Leonid Kopiy, Igor Fizyk, Carla Barlagne and David Miller
Sustainability **2021**, *13*(8), 4360; **https://doi.org/10.3390/su13084360** - 14 Apr 2021
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Abstract In this paper, we elaborate an Institutional Analysis and Reconfiguration Framework centered around the 'action arena' theoretical approach. We develop this framework to analyze institutional reconfiguration to enhance sustainability, and operationalize it using research methods which focus on documentation of the institutional contexts [...] Read more.
(This article belongs to the Special Issue Forest Policy and Management Practices for the 21st Century)

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What Are the Impacts of Social Innovation? A Synthetic Review and Case Study of Community Forestry in the Scottish Highlands

by Carla Barlagne, Mariana Melnykovych, David Miller, Richard J. Hewitt, Laura Secco, Elena Pisani and Maria Nijnik
Sustainability **2021**, *13*(8), 4359; **https://doi.org/10.3390/su13084359** - 14 Apr 2021
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Abstract In a context of political and economic austerity, social innovation has been presented as a solution to many social challenges, old and new. It aims to support the introduction of new ideas in response to the current urgent needs and challenges of vulnerable [...] Read more.
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Impact of Enhanced Enterprise Resource Planning (ERP) on Firm Performance through Green Supply Chain Management

by Zeplin Jiwa Husada Tarigan, Hotlan Siagian and Ferry Jie
Sustainability **2021**, *13*(8), 4358; **https://doi.org/10.3390/su13084358** - 14 Apr 2021
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Abstract This study investigates the impact of enhanced enterprise resource planning (ERP) on firm performance through green supply chain management, supplier integration, and internal integration. The population is the manufacturer domiciled in East Java, Indonesia, which has implemented ERP and been certified by the [...] Read more.
(This article belongs to the Special Issue Emerging Emergencies and Sustainability: The Role of Supply Chain and Logistics)

Correlation between Land Use and the Transformation of Rural Housing Model in the Coastal Region of Syria

by Nebras Khadour, Nawarah Al Basha, Máté Sárospataki and Albert Fekete
Sustainability **2021**, *13*(8), 4357; **https://doi.org/10.3390/su13084357** - 14 Apr 2021
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Abstract The phenomenon of urban sprawl has caused radical changes in the spatial structure of cities and rural areas all around the world. Syria is among the developing countries that have experienced this phenomenon. Some of the resulted processes of urban sprawl like urbanization [...] Read more.
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Empty Summer: International Tourist Behavior in Spain during COVID-19

by José Antonio Donaire, Núria Galí and Raquel Camprubi
Sustainability **2021**, *13*(8), 4356; **https://doi.org/10.3390/su13084356** - 14 Apr 2021
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Abstract COVID-19 has led to the biggest tourism crisis in modern Spanish history. Although its borders were opened in June 2020, incoming international tourism to Spain was very low. Tourist behavior, however, has been very diverse between types of tourism. Data from credit card [...] Read more.
(This article belongs to the Special Issue The Rise of Domestic Tourism and Non-travelling in the Times of COVID-19)

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Assessment of the Sustainability of a Real Estate Project Using Multi-Criteria Decision Making

by Nomeda Dobrovolskienė, Anastasija Pozniak and Manuela Tvaronavičienė
Sustainability **2021**, *13*(8), 4352; **https://doi.org/10.3390/su13084352** - 14 Apr 2021
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Abstract Today, sustainability, sustainable development and clean environment come to the fore worldwide. Consequently, the concept of sustainability has been introduced in project management. Sustainability issues have gained particular attention in the real estate sector. However, despite the fact that this sector has a [...] Read more.
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The Perceived Importance of Cybercrime Control among Police Officers: Implications for Combatting Industrial Espionage

by Seung-Yeop Paek, Mahesh K. Nalla, Yong-Tae Chun and Julak Lee
Sustainability **2021**, *13*(8), 4351; **https://doi.org/10.3390/su13084351** - 14 Apr 2021
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Abstract The current research explored the predictors of how police officers perceived the importance of combatting cybercrime. This is an era in which industrial security is threatened by perpetrators who use advanced techniques to steal information online. Understanding how law enforcement officers view the [...] Read more.
(This article belongs to the Special Issue Industrial Security for Sustainable Technology Innovation and Economic Growth)

Pathways to Commercialisation for Brown Coal Fly Ash-Based Geopolymer Concrete in Australia

by Ezzatollah Shamsaei, Owen Bolt, Felipe Basquiroto de Souza, Emad Benhelal, Kwesi Sagoe-Crentsil and Jay Sanjayan
Sustainability **2021**, *13*(8), 4350; **https://doi.org/10.3390/su13084350** - 14 Apr 2021
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Abstract Utilising geopolymer as a construction material has gained institutional and commercial interest over the past decade, due to its favourable emissions profile as an alternative to carbon-intensive Ordinary Portland Cement-based concrete, which currently accounts for around 7% of global carbon emissions. While significant [...] Read more.
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Exploring the Roles of Self-Efficacy and Technical Support in the Relationship between Techno-Stress and Counter-Productivity

by Dae Geun Kim and Chang Won Lee
Sustainability **2021**, *13*(8), 4349; **https://doi.org/10.3390/su13084349** - 14 Apr 2021
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Abstract Organizational reliance on information and communication technology (ICT) is more likely to induce techno-stress as a detrimental effect, which has a negative impact on productivity. Businesses should make organizational efforts to decrease counter-productivity, a negative effect of techno-stress, to create sustainable productivity by [...] Read more.

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Exploring Green Marketing Orientations toward Sustainability the Hospitality Industry in the COVID-19 Pandemic

by Chun-Yi Ho, Bi-Huei Tsai, Chiao-Shan Chen and Ming-Tsang Lu
Sustainability **2021**, *13*(8), 4348; **https://doi.org/10.3390/su13084348** - 14 Apr 2021
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Abstract The effects of green marketing orientations for increasing the competitive advantage and improving the sustainability of the hospitality industry during the COVID-19 pandemic are receiving more attention. As the hospitality industry attempts to assimilate green marketing and move in the path of sustainable [...] Read more.
(This article belongs to the Special Issue Green Consumer Behavior, Green Products & Services, and Green Brands in the Tourism/Hospitality Industry)

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Terraced Landscapes Regeneration in the Perspective of the Circular Economy

by Antonia Gravagnuolo and Mauro Varotto
Sustainability **2021**, *13*(8), 4347; **https://doi.org/10.3390/su13084347** - 14 Apr 2021
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Abstract Terraced landscapes were for centuries forms of sustainable and multifunctional land management, results of a long and intimate relationship between peoples and their environment. They demonstrated a rich cultural diversity and agrobiodiversity through sustainable land-use systems. These productive cultural landscapes in many cases [...] Read more.
(This article belongs to the Special Issue The Valorization of the Cultural Heritage and Landscape as the Entrance Point for the Circular City Strategy)

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Priming Effects of Cover Cropping on Bacterial Community in a Tea Plantation

by Fo-Ting Shen and Shih-Han Lin
Sustainability **2021**, *13*(8), 4345; **https://doi.org/10.3390/su13084345** - 14 Apr 2021
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Abstract The acidic nature of red soil commonly found in tea plantations provides unique niches for bacterial growth. These bacteria as well as soil properties are dynamic and vary with agricultural management practices. However, less is known about the influence of manipulation such as [...] Read more.
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The Circular Benefits of Participation in Nature-Based Solutions

by Macarena L. Cárdenas, Vanessa Wilde, Alex Hagen-Zanker, Isabel Seifert-Dähnn, Michael G. Hutchins and Steven Loiselle
Sustainability **2021**, *13*(8), 4344; **https://doi.org/10.3390/su13084344** - 14 Apr 2021
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Abstract Nature-based solutions (NbS) provide direct benefits to people who live in areas where these approaches are present. The degree of direct benefits (thermal comfort, reduced flood risk, and mental health) varies across temporal and spatial scales, and it can be modelled and quantified. [...] Read more.
(This article belongs to the Special Issue Citizen Science for Sustainable Cities: Investigating Nature Based Solutions)

Fabrication of Poly (Acrylonitrile-Co-Methyl Methacrylate) Nanofibers Containing Boron via Electrospinning Method: A Study on Size Distribution, Thermal, Crystalline, and Mechanical Strength Properties

by Meisam Sadeghi, Zahra Moghimifar, P. Senthil Kumar, Hamedreza Javadian and Majid Farsadrooh
Sustainability **2021**, *13*(8), 4342; **https://doi.org/10.3390/su13084342** - 14 Apr 2021
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Abstract Electrospun polymeric nanofibers have attracted great attention in filtration systems and protective clothes. One of them is polyacrylonitrile (PAN) nanofibers, which are a suitable choice for the fabrication of protective clothes in the defense industry, due to their good fiber formation and easy [...] Read more.

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Influence of Anthropogenic Loads on Surface Water Status: A Case Study in Lithuania

by Laima Česonienė, Daiva Šileikienė, Vitas Marozas and Laura Čiteikė
Sustainability **2021**, *13*(8), 4341; **https://doi.org/10.3390/su13084341** - 14 Apr 2021
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Abstract Twenty-six water bodies and 10 ponds were selected for this research. Anthropogenic loads were assessed according to pollution sources in individual water catchment basins. It was determined that 50% of the tested water bodies had N_{total} values that did not correspond to [...] Read more.

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Geography Education for Promoting Sustainability in Indonesia

by Nabila Nurul Hawa, Sharifah Zarina Syed Zakaria, Muhammad Rizal Razman and Nuriah Abd Majid
Sustainability **2021**, *13*(8), 4340; **https://doi.org/10.3390/su13084340** - 13 Apr 2021
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Abstract Education for the environment and sustainable development is the one important thing for being studied. At formal school in Indonesia, it was integrated into the subject matter like social science, natural science, geography, or biology. The study about geography education for promoting sustainability [...] Read more.
(This article belongs to the Special Issue Sustainability in Biology, Geography and Interdisciplinary Studies and Sustainable Pedagogies)

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Implementation of Accelerated Policy-Driven Sustainability Transitions: Case of Bharat Stage 4 to 6 Leapfrogs in India

by Aditi Khodke, Atsushi Watabe and Nigel Mehdi
Sustainability **2021**, *13*(8), 4339; **https://doi.org/10.3390/su13084339** - 13 Apr 2021
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Abstract In the face of pressing environmental challenges, governments must pledge to achieve sustainability transitions within an accelerated timeline, faster than leaving these transitions to the market mechanisms alone. This had led to an emergent approach within the sustainability transition research (STR): Accelerated policy-driven [...] Read more.
(This article belongs to the Special Issue Sustainable Consumption and Production Patterns: Policy Design and Evaluation)

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Research Progress on Aerobiology in the Last 30 Years: A Focus on Methodology and Occupational Health

by Andrea Lancia, Pasquale Capone, Nicoletta Vonesch, Armando Pelliccioni, Carlo Grandi, Donatella Magri and Maria Concetta D'Ovidio
Sustainability **2021**, *13*(8), 4337; **https://doi.org/10.3390/su13084337** - 13 Apr 2021
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Abstract Aerobiology, as a scientific discipline, developed during the last century and has been applied to different types of organisms and scenarios. In the context of the Integrated Evaluation of Indoor Particulate Exposure (VIEPI) project, we conducted a bibliometric study of the scientific literature [...] Read more.
(This article belongs to the Special Issue Integrated Evaluation of Indoor Particulate Matter (VIEPI) Project: Study Design, Results and Open Questions)

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Evaluation of Sustainable Development in Six Transformation Fields of the Central Taiwan Science Park

by Fu-Hsuan Chen and Hao-Ren Liu
Sustainability **2021**, *13*(8), 4336; **https://doi.org/10.3390/su13084336** - 13 Apr 2021
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Abstract By the establishment of science parks, Taiwan has achieved the ability to form high-tech industrial clusters and provided an environment for sustainable industrial development. This study analyzes the sustainable development strategy of the Central Taiwan Science Park (hereafter CTSP). The questions addressed here [...] Read more.
(This article belongs to the Collection Sustainable Public Administration)

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Machine Learning-Based Approach for Seismic Damage Prediction Method of Building Structures Considering Soil-Structure Interaction

by Jongmuk Won and Jiuk Shin
Sustainability **2021**, *13*(8), 4334; **https://doi.org/10.3390/su13084334** - 13 Apr 2021
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Abstract Conventional seismic performance evaluation methods for building structures with soil–structure interaction effects are inefficient for regional seismic damage assessment as a predisaster management system. Therefore, this study presented the framework to develop an artificial neural network-based model, which can rapidly predict seismic responses [...] Read more.
(This article belongs to the Section Hazards and Sustainability)

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The Nexus between Team Culture, Innovative Work Behaviour and Tacit Knowledge Sharing: Theory and Evidence

by Cem Işık, Ekrem Aydın, Tarik Dogru, Abdul Rehman, Rafael Alvarado, Munir Ahmad and Muhammad Irfan

Sustainability **2021**, *13*(8), 4333; **https://doi.org/10.3390/su13084333** - 13 Apr 2021

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Abstract Tacit knowledge sharing is an essential intellectual capital for frontline employees in hotel enterprises. While the relationship of knowledge sharing with team culture (TC) and innovative work behavior (IWB) was investigated in the extant literature, little is known about the extent to which [...] Read more.

(This article belongs to the Special Issue Changing Tourist Behaviors for Sustainability)

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Integrated Hydraulic Modelling, Water Quality Modelling and Habitat Assessment for Sustainable Water Management: A Case Study of the Anyang-Cheon Stream, Korea

by Byungwoong Choi and Seung Se Choi

Sustainability **2021**, *13*(8), 4330; **https://doi.org/10.3390/su13084330** - 13 Apr 2021

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Abstract Recent ecological stream restoration projects have focused on expanding the water-friendly space of streams, promoting the health of aquatic ecosystems, and restoring various habitats, which raise the need for relevant research. Applying integrated environmental analysis, this study quantifies the change in hydraulic characteristics [...] Read more.

(This article belongs to the Section Environmental Sustainability and Applications)

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An Approach for Designing Mixed Light-Emitting Diodes to Match Greenhouse Plant Absorption Spectra

by Latifa Bachouch, Neermalsing Sewraj, Pascal Dupuis, Laurent Canale, Georges Zissis, Lotfi Bouslimi and Lilia El Amraoui

Sustainability **2021**, *13*(8), 4329; **https://doi.org/10.3390/su13084329** - 13 Apr 2021

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Abstract We report a methodological approach for simulating luminary output radiation, which is achieved by mixing light-emitting diodes (LEDs) in order to match any plant absorption spectrum. Various recorded narrow-band LED spectra of different colors were first characterized and then fitted with a multi-Gaussian [...] Read more.

(This article belongs to the Special Issue The Future of Interior Lighting is here)

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On the Synergy between Virtual Reality and Multi-Agent Systems

by Alejandra Ospina-Bohórquez, Sara Rodríguez-González and Diego Vergara-Rodríguez

Sustainability **2021**, *13*(8), 4326; **https://doi.org/10.3390/su13084326** - 13 Apr 2021

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Abstract Multi-agent systems integrate a great variety of artificial intelligence techniques from different fields, these systems have made it possible to create intelligent systems more efficiently. On the other hand, virtual reality applications are accepted as viable techniques in different areas such as visualization, [...] Read more.

(This article belongs to the Special Issue Virtual and Augmented Reality Learning Environments for Sustainable Development)

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The Role of Information Management for the Sustainable Conservation of Cultural Heritage

by Jaione Korro Bañuelos, Álvaro Rodríguez Miranda, José Manuel Valle-Melón, Ainara Zornoza-Indart, Manuel Castellano-Román, Roque Angulo-Fornos, Francisco Pinto-Puerto, Pilar Acosta Ibáñez and Patricia Ferreira-Lopes

Sustainability **2021**, *13*(8), 4325; **https://doi.org/10.3390/su13084325** - 13 Apr 2021

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Abstract Central to the entire discipline of heritage restoration and conservation is the concept of information management. Nevertheless, traditionally, conservation and restoration has been a poorly documented discipline, which has led not only to a lack of standardization and awareness about the processes carried [...] Read more.

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Evaluating Operational Features of Three Unconventional Intersections under Heavy Traffic Based on CRITIC Method

by Binghong Pan, Shangru Liu, Zhenjiang Xie, Yang Shao, Xiang Li and Ruicheng Ge
Sustainability **2021**, *13*(8), 4098; **https://doi.org/10.3390/su13084098** - 07 Apr 2021
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Abstract Conventional four-legged intersections are inefficient under heavy traffic requirements and are prone to congestion problems. Unconventional intersections with innovative designs allow for more efficient traffic operations and can increase the capacity of the intersection, in some cases. Common unconventional designs for four-legged intersections [...] Read more.
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Development of an Ignition System and Assessment of Engine Performance and Exhaust Characteristics of a Marine Gas Engine

by Kichol Noh and Changhee Lee
Sustainability **2021**, *13*(8), 4097; **https://doi.org/10.3390/su13084097** - 07 Apr 2021
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Abstract In recent years, marine engine manufacturers have become increasingly interested in gas engines as an alternative to diesel engines to address rising crude oil prices and environmental regulations. In this study, a 1.6 MW dedicated gas engine was developed based on a diesel [...] Read more.

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The Urban Environment Impact of Climate Change Study and Proposal of the City Micro-Environment Improvement

by Jozefína Pokrývková, Ľuboš Jurík, Lenka Lackóová, Klaudia Halászová, Richard Hanzlík and Mohammad Ebrahim Banihabib
Sustainability **2021**, *13*(8), 4096; **https://doi.org/10.3390/su13084096** - 07 Apr 2021
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Abstract The water management of cities and villages faces many challenges. Aging infrastructure systems operate for many years after their theoretical lifetime (operation) with a very high need for reconstruction and repair. The solution is proper rainwater management. The investigated area is part of [...] Read more.
(This article belongs to the Section Air, Climate Change and Sustainability)

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The Use of Activities and Resources in Archaeological Museums for the Teaching of History in Formal Education

by Ainoa Escribano-Miralles, Francisca-José Serrano-Pastor and Pedro Miralles-Martínez
Sustainability **2021**, *13*(8), 4095; **https://doi.org/10.3390/su13084095** - 07 Apr 2021
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Abstract The research objectives of this paper are to compare the activities which have been prepared in the design of field trips from the perspective of teachers and museum educators, as well as to describe the use of resources and materials from the point [...] Read more.
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Open Access Editorial

Sustainability Issues of Micro and Macro-Scale Changes in Daily and Residential Mobility

by Philippe Gerber, Sébastien Lord, Kevin Manaugh, Veronique Van Acker and Samuel Carpentier-Postel
Sustainability **2021**, *13*(8), 4093; **https://doi.org/10.3390/su13084093** - 07 Apr 2021
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Abstract For several decades, changes in travel behavior have been at the heart of transportation research, either to adapt the supply of transportation or to better understand the evolution of travel demand [...] Full article
(This article belongs to the Special Issue Sustainability Issues of Micro and Macro-Scale Changes in Daily and Residential Mobility)

Land-Use and Land-Cover (LULC) Change Detection and the Implications for Coastal Water Resource Management in the Wami–Ruvu Basin, Tanzania

by Jamila Ngondo, Joseph Mango, Ruiqing Liu, Joel Nobert, Alfonse Dubi and Heqin Cheng
Sustainability **2021**, *13*(8), 4092; **https://doi.org/10.3390/su13084092** - 07 Apr 2021
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Abstract Evaluation of river basins requires land-use and land-cover (LULC) change detection to determine hydrological and ecological conditions for sustainable use of their resources. This study assessed LULC changes over 28 years (1990–2018) in the Wami–Ruvu Basin, located in Tanzania, Africa. Six pairs of [...] Read more.

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Constructing Organic Food through Urban Agriculture, Community Gardens in Seville

by Mario Jordi-Sánchez and Antonio Luis Díaz-Aguilar
Sustainability **2021**, *13*(8), 4091; **https://doi.org/10.3390/su13084091** - 07 Apr 2021
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Abstract The growing presence of community or allotment gardens seeks to respond to the challenges of today's urban societies in terms of sustainability. The food dimension of this phenomenon is one of its most important aspects, with clear repercussions on improving the quality of [...] Read more.
(This article belongs to the Special Issue Rural Sociology, Agriculture and Ecological Territorial Development)

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Investigation on Recycling Dry Toilet Generated Blackwater by Anaerobic Digestion: From Energy Recovery to Sanitation

by Siqi Zuo, Xiaoqin Zhou, Zifu Li, Xuemei Wang and Longbin Yu
Sustainability **2021**, *13*(8), 4090; **https://doi.org/10.3390/su13084090** - 07 Apr 2021
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Abstract Anaerobic digestion (*AD*) has been widely adapted for blackwater treatment, however, the effect of water-conserving toilet generated blackwater on the *AD* process is still unknown. In this study, the anaerobic digestion process of dry toilet generated blackwater was investigated by means [...] Read more.
(This article belongs to the Special Issue Inclusive Water, Sanitation, Hygiene and Health (WASH2): Towards a Sustainable and Healthy Society)

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Adjustment of Lighting Parameters from Photopic to Mesopic Values in Outdoor Lighting Installations Strategy and Associated Evaluation of Variation in Energy Needs

by Enrique Navarrete-de Galvez, Alfonso Gago-Calderon, Luz Garcia-Ceballos, Miguel Angel Contreras-Lopez and Jose Ramon Andres-Diaz
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Impact of Enhanced Enterprise Resource Planning (ERP) on Firm Performance through Green Supply Chain Management

Zeplin Jiwa Husada Tarigan [1,*], Hotlan Siagian [1] and Ferry Jie [2]

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Abstract: This study investigates the impact of enhanced enterprise resource planning (ERP) on firm performance through green supply chain management, supplier integration, and internal integration. The population is the manufacturer domiciled in East Java, Indonesia, which has implemented ERP and been certified by the International Organization for Standardization (ISO) in the environmental management system. Data collection used a questionnaire designed with the five-point Likert scale. Of 243 manufacturers, 150 questionnaires were distributed, and 135 questionnaires are considered valid for analysis. Data analysis used smart PLS software. The result indicated that all eight predetermined hypotheses were supported. Enhanced ERP affects supplier integration, internal integration, and green supply chain management. Internal integration affects green supply chain management and firm performance. Supplier integration affects green supply chain management and firm performance. Green supply chain management affects firm performance. An interesting finding is that green supply chain management, internal integration, and supplier integration mediate the effect of enhanced ERP on firm performance. This study's novelty lies in the research model that analyzes the relationship between the four constructs simultaneously with the green supply chain management, internal integration, and supplier integration as a mediating variable. The research provides an insight for the manager on how to improve the firm performance in supply chain management. This study could also contribute to the current research in supply chain management.

Keywords: enhanced ERP; GSCM; supplier integration; internal integration; firm performance

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1. Introduction

The rapid development of information technology entails that companies make adjustments to keep the enterprise resources planning (ERP) system upgraded to the latest technology advancement in manufacturing processes. Every company makes every effort to improve productivity, efficiency, speed, and service, innovating to stay ahead and survive in the market. In addition to productivity and efficiency, companies must also understand and know what is needed by consumers. Supply Chain Management is an approach to achieving a more efficient integration of related organizations within a supply chain: suppliers, manufacturers, distributors, retailers, and customers. Supply chain management adoption enables the company to integrate the material and service procurement activities, conversion into semi-finished goods and final products, and delivery to customers [1].

Supply chain management is an approach applied to bring together suppliers, entrepreneurs, warehouses, and other storage areas (distributors, retailers, and retailers), so that products can be produced and distributed in the right amount, the right location, and the right time meanwhile reducing the costs and meet customer needs [2]. Supply chain management is essential for the company the pursuit of product sustainability in the marketplace. The company implements green supply chain management (GSCM) to increase the company's competitiveness by taking into account the issue of the company's environmental conditions [3]. The company, adopting the green supply chain management,

needs to communicate with the company's upstream, downstream companies. The GSCM takes care of reducing waste, use raw materials efficiently, and result in a minimum impact on the environment. For this goal, the company usually adopts a new or innovative process. The implementation of GSCM represents a positive image to the community in reducing pollution to the environment and can meet and even exceed local government regulations' limits when the company implements it [4]. GSCM will be easily implemented when the company can implement information technology that is integrated internally and externally. Information technology in use by companies such as ERP systems can fully integrate all related partners within a supply chain. This ERP system also ensures that one department with other departments is integrated and uses a single database system [5].

The ERP system enables the enterprise to build internal integration between departments and external integration with suppliers and customers [6]. This integration allows the company to reduce production costs by collaborating with suppliers and customers [7]. The adoption of the ERP system by the company provides the company an overview of internal conditions by providing regular reports on the availability of raw materials, which, in the end, enables the supplier to provide the company's needs. The supplier can also provide the schedule progress every day, making it easier for marketing, production, and transportation departments to provide delivery on time, provide data about the raw materials and goods received in the warehouse to facilitate the purchasing, warehouse, and planning department in forecasting raw material requirement [8].

Internal integration in the company enables the company to quickly share information between cross-functional departments to improve response changes [9]. The company's internal integration provides excellent communication and collaboration between synchronizing processes, synchronizing in meeting customer needs, and synchronizing with suppliers in procuring material [1]. Internal integration can better understand the work and impact in carrying out company policies to adopt GSCM. The company's information technology will provide advantages for the company, including fast and precise data transfer and access, reduced use of paper for the company, faster communication, coordination between departments, and data in real-time.

Supplier integration is considered the primary managerial strategy to improve purchasing performance, and customer integration to improve operational performance [10]. The integration of suppliers aimed at creating a rapid supply network structure. The company's ability to build integration with suppliers can provide efficiency in the procurement of raw materials, on-time delivery of raw materials, company flexibility, and increase company performance. The integration built by the company with suppliers can collaborate so that the flow of products, services, financial information, and decision making together provides effectiveness and efficiency for the company [11].

Integration with suppliers gives suppliers trust in managing information to share information with suppliers to provide its needs. ERP systems can provide integration within the company so that it has an impact on green supply chain management practice [1]. Green Supply chain Management practices conducted by the company include selecting and evaluating suppliers, submitting to suppliers in managing company inventory, ecodesign, packaging, reverse logistics at the company, and building active cooperation with suppliers. Indonesia currently provides secondary pollution globally, so the government is currently assessing companies to produce environmentally friendly products. This condition resulted in manufacturing companies trying hard to implement green supply chain management using an ERP system that has long been implemented. Companies increase internal and external integration of the company to be able to use environmentally friendly raw materials and environmentally friendly processes in order to be able to maintain the company's operational performance [7,10]. The companies in Indonesia are trying to quickly adjust its operational conditions to the government's regulations.

Corporate care is very important for the environment by considering implementing green in its supply chain flow. Green supply chain control for manufacturing companies is an important thing to maintain its sustainability by considering implementing regula-

tions that apply to a country. The Government of Indonesia, through regulations of the Government of the Republic of Indonesia, has strictly regulated environmental protection and management. The environment is a unity of space with all objects, power, conditions, and living things, including humans and their behavior, which affect nature itself, the continuity of life, and humans' welfare and other living things. Sustainable development determined by the Government of Indonesia is a conscious and planned effort to integrate environmental, social, and economic aspects into a development strategy to ensure environmental integrity and the safety, capability, welfare, and quality of life of present and future generations.

In summary, the above discussion has revealed five constructs that authors consider to examine in this study, namely, enhanced ERP, GSCM, supplier integration, internal integration, and firm performance. The previous research has examined the direct relationship between two consecutive constructs, and the previous research has been conducted during the normal situation. This study will fill in the gap to examine the relationship between the five constructs in a single model dealing with enhanced ERP impact on firm performance through supplier integration, GSCM, and internal integration. This study's novelty lies in the proposed research model, which does not exist before, and the study is conducted during the covid-19 Pandemic. This research model consequently raised three mainstream research questions to be examined as follows: 1) does enhance ERP improve supplier integration, GSCM, and internal integration, 2) does supplier integration, GSCM, and internal integration directly influence firm performance, 3) does enhanced ERP directly improve firm performance through mediating role of supplier integration, GSCM, and internal integration. This paper's main goal is to examine the research questions and whether the built model works well amid the Covid-19 pandemic era. This study is highly important because it could provide insight for practitioners and managers on improving the firm's performance in supply chain management. This paper also could contribute to the current research in the supply chain management theory.

2. Literature Review

2.1. Green Supply Chain Management

Green supply chain management (GSCM) is a concept of the supply chain in the procurement of materials, the company's production processes, and distribution of company products by taking into account the company's environment in order to be able to maintain sustainability of the company [1,12]. GSCM is essential for companies because the community pressures it as customers and government institutions through the regulations set [4]. Companies must practice GSCM in producing products following customer demand and regulations set by the government [3].

GSCM is now essential for companies to increase the level of efficiency and effectiveness in producing products. Research conducted by Famiyeh et al. [3] in measuring green supply chain management using that there is cooperation with suppliers in paying attention to the environment, conducting audits of suppliers related to the environment, providing environmentally friendly product information for end-users, requiring suppliers to have certification related to the environment and monitoring and considering the level pollution and waste for suppliers. Sharma and Gandhi's research [13] measures green supply chain practices regarding environmental certification, preventing pollution, designing environmentally friendly products, life cycle assessment, and reverse logistics. Wang and Dai [14] state that GSCM practices, consisting of internal and external management, impact environmental performance, social performance, and improve financial firm performance. Companies always try to improve the environment and social community in order to maintain the environmental sustainability. This approach provided a guide for the company, such as in the material procurement and improving customer satisfaction, which is the goal of GSCM [15].

Research Laosirihongthong et al. [4] measured green supply chain practices as green purchasing practices, eco-design practices, reverse logistics practices, legislation, and

regulatory practices. Best practice in implementing green procurement is determined by motivation and barriers from external and internal companies to improve the environment, financial and operational performance [16]. GSCM is practically based on the green SCOR consisting of the plan, source, make, deliver, and return [17]. Adopting GSCM practices enable furniture manufacturing companies to maintain a sustainable supply chain.

Al-Ghwayeen and Abdallah's research [12] measured green supply chain management using eco-design, green purchasing in raw material procurement, internal environmental management, and cooperation with customers. Research conducted by Luthra et al. [18] measured green supply chain practice, Green product development, Green design, Green purchasing, and green raw material procurement, Green manufacturing, and Green transportation and distribution. This study establishes indicators in measuring GSCM is cooperation with suppliers (GSCM1) [3], green purchasing (GSCM2) [18], green manufacturing (GSCM3) [18], policy management (GSCM4) [4], and government regulations (GSCM5) [4].

2.2. Supplier Integration

The company builds supply chain integration through integration with its material suppliers and integration with the corporate purchasing department. Consumer integration focuses on the relationship between seller and buyer. The company or organization will implement several new components to meet its customers' needs, such as product innovation or innovation in serving customers. This action can increase the company's competitiveness with its competitors [19]. Consumer integration is the active involvement of companies in improving product quality and increasing operational effectiveness to maintain good relations and increase customer satisfaction. Consumers can also provide feedback to companies on whether the company has fulfilled their desires and overall satisfaction [20]. Supplier integration is a collaboration between a buyer's company and its related suppliers in the process of entering supplies to buyer's companies for mutually acceptable results. Supplier integration is an activity that involves suppliers and retailers. Activities undertaken include selecting products to sell, decisions about how to determine prices and market products, and ensuring that products are delivered to the store on time, integration can be suitable or unsuitable [21]. Supplier integration is an integration built to collaborate between suppliers and companies in formulating material procurement strategies, implementation, and behavior of the two organizations to improve company performance in construction companies in Korea [22]. This integration includes collaborative decision-making processes to achieve an efficient flow of resources among members of the supply chain and adjusting strategies that refer to consistency in developing and implementing policies in improving organizational performance between the company and its partners [11].

The measurement indicators consist of, firstly, the companies share information with their suppliers (related to sales forecasts, production plans, delivery status, and stock levels); and secondly, collaborative development with significant suppliers (related to supplier development, product design, sharing risks or values, and long-term agreements), joint decision making, and system coupling with major suppliers [11]. Measuring the external integration used in the study of Woo et al. [22], among others, can achieve goals together, able to build mutual understanding and responsibility of risk, build partnerships with suppliers to pay attention to the environment, share planning with our partners, and share resources, skills, and knowledge to strengthen collaboration. Supplier integration measurements the extent to which the company shares the master production schedules with critical suppliers, determining shared goals with key suppliers, identifying and determining new markets together with key users, always sharing new ideas with key suppliers, and sharing best practices with key suppliers [23]. The indicators used are sharing information with suppliers (S.In1) [11], collaborating with suppliers (S.In2) [11], determining shared goals with suppliers (S.In3) [23], sharing ideas in innovating processes (S.In4) [19], and determining decisions together with suppliers (S.In5) [11].

2.3. Internal Integration

Internal integration is a process that occurs within a company involving interaction between departments. Internal integration is a process carried out to facilitate interaction, communication, and collaboration between the company's functions in achieving the company goals [24,25]. Effects arising from departments' interactions can be positive if the interactions that arise are overall good [26]. Internal integration is vital for customers. The level and quality of internal integration affect the position of a company in the eyes of customers. The higher the internal integration of a company, the better the company's performance [27].

Internal integration is one way for companies to provide some information that includes functions and activities that integrate. In achieving internal integration in an organization, managers usually use enterprise resources planning (ERP) systems [28]. Internal integration is built by the company so that synchronization and collaboration between departments within the company can be adjusted to suppliers and customers [29]. The area of function in companies related to different departments is integrated to fulfill customer orders. Cross-functional of the company to do joint planning, share information between departments, and work together to achieve the goals set [30].

The company integrates between departments related to manufacturing, distribution, customers, and suppliers determined by integrating functions within the company to increase competitiveness in the long run [2]. Internal integration measurement conducted is measured by information systems management and process control [31]. Management of information systems is measured by sharing about defects in the company's production floor, sharing production schedules with the relevant departments, and sharing information about machine breakdowns with the relevant departments. Processes measure process control on the production floor, and process capabilities and equipment on the production floor are jointly controlled.

The measurement indicator of internal integration is sharing information with the purchasing department (sharing sales forecast, sharing production plans, sharing production progress in the company and stock level inventory), together with the purchasing department in making decisions, sharing information with the purchasing department and sharing- the same as the sales department in making decisions [11]. Demeter et al. [32] used the measurement indicator for internal integration as sharing information with other departments, jointly making decisions, sharing innovation between departments, making innovations for companies, using information technology to support communication between departments, and building a performance management system with other departments. Research conducted by Jajja et al. [11] and Titah et al. [33] become an indicator of this research related to internal integration, namely, joint decisions between departments concerned with considering company margins (In. I1) [11], joint decisions between departments related to inventory levels (In.I2) [11], sharing decisions related to company goals (I.In3) [11], sharing decisions related to pricing (I.In4) [33], and sharing related decisions with product shipments (I.In5) [33].

2.4. Enhanced ERP

Companies are trying to build information technology systems to adapt to changes in the company's external environment. Adaptation is an ability that must be done in a company to face a significant change and influence the company's management system. ERP system is a technology system used in building company competitiveness because it can provide operational excellence [34]. It is indispensable for a company to survive and sustainable the intense competition and fasts. ERP system is an information technology-based system that can integrate its business functions to be integrated and efficient [35]. The company is also able to adjust quickly by knowing the real condition of the company. The company's real condition provides information inside and outside the company using integrated information technology called enterprise resources planning (ERP). An inte-

grated system enables the organization to share the information with all functions and enhances ERP users' satisfaction and benefit from using the ERP system [36].

ERP system can also be said as a software system that can integrate all business functions of a company; as a place for sharing information, knowledge data within the organization as a container for company automation systems and access to information that can provide data in real-time [8]. The companies always try to adjust the ERP according to its needs, the company's operational system's uniqueness, and the company's key user and end-user [37]. Changes in the ERP configuration system will present huge costs and risks when implemented [34]. The indicator used by Elkhani et al. [38], the ERP system usage, uses the ERP system intensively, often using the ERP system at work, and overall, always using ERP. The measurement used in this study adopted Tarigan et al. [39] and Ince et al. [40], namely ERP system quality function (EERP1) [39], ERP system information quality (EERP2) [39,40], ERP system used intensively (EERP3) [40], ERP system on personal impact (EERP4) [39,40], and ERP system on organizational impact (EERP5) [40].

2.5. Firm Performance

Firm performance results obtained from a company's management activity and used by the company to be a benchmark parameter in assessing company management's success [41]. Performance measurement of the company continues to grow, which includes measurements and uses qualitative and quantitative approaches. The company's management always pays attention to the company's operational achievements and finances [16]. Company performance is produced from the process of activities within the company during specific periods concerning predetermined standards. Companies control operational performance in general by using periods of the daily, weekly, monthly, quarterly, semester, and yearly achievement periods. This activity is controlled continuously to understand the progress of the company's operating results.

The company determines the measurement of financial performance to consider the return on investment, profitability, market share, revenue growth at a more competitive rate and is carried out in monthly, quarterly, semester, and annual periods. Performance measurement systems have tangible and intangible measures with a balance of the two types used to measure performance. Building an ethical supply chain system can undoubtedly be a significant determinant in improving company performance. This relationship can develop an innovation that can help companies improve productivity and quality of production processes in the supply chain to produce products, control costs, and supplier relationships that affect overall company performance [42]. According to Ince et al. [40], the measurement of company performance is divided into two, namely, financial performance and market performance. Criteria for measuring financial performance are increasing sales profit margins and increasing ROI (Return on Investment) value. In comparison, the criteria for measuring market performance are sales growth, market share growth, and other competitiveness improvements.

Al-Shboul et al. [2] state that market performance and financial performance measure firm performance. Market performance is measured using the company's ability to have market share, its ability to have market share growth, and its ability to have sales growth. Measurements used by using financial performance are measured by ROI, the company's ability to have ROI growth, the company's profit margin, and the company's competitiveness at this time. Chong et al. [41] used indicators to measure organizational performance, including reducing lead time, increasing inventory turnover speed, reducing defective products, reducing product returns from customers, sales levels, cost reduction, and meeting customer requirements. Firm performance measured in the study of Gandhi et al. [13] return on assets, revenues, and profits of the company. Measurement of operational performance reduces management costs, reduces lead-time, reduces in order time, reduces material damage, and reduces late delivery level [43]. Performance measurements used to concern the operational side are determined delivery accuracy, increased flexibility, ability to fulfill orders, and increased customer satisfaction [5]. This study determines com-

panies' performance with non-financial performance data on manufacturing companies. The financial performance is difficult in getting data from manufacturing companies due to the high level of confidentiality that companies have. The indicators used in this study are the quality of the products produced by the company (FP1) [41,43], reduction of production costs (FP2) [5,41], reducing lead time (FP3) [41,43], reducing the company's inventory level (FP4) [5,41], and reducing product returns from customers (FP5) [41].

3. Relations between Concepts

3.1. Relationship between ERP System Enhance Concept and Supplier Integration

Alignment of the role of ERP systems in the company can build integration with the company's suppliers. The role of ERP contributes to building a single database system that companies can use to share with suppliers. Integration suppliers are built by companies to build collaboration in providing information using information technology [22]. The organization currently has a lot of integrating existing data in the company and allows it to be integrated with the supplier partners to fulfill customer demands [33,44]. Integrated information technology can build integration with suppliers in integrating planning and coordinating production lines with major suppliers [45]. The usage of the integrated information systems is necessary to synchronize the company with the supply. The integration of information technology can enable the integration of suppliers with companies in terms of production planning and capacity, delivery of orders, and stock levels promptly that has more directly interacted with suppliers. An ERP system can be used by an organization to build an effective system to improve user satisfaction [34]. Integration can maintain the flow of material following the production process's rhythm and adjusted to the suppliers [46]. The company cooperates with suppliers in sharing information with key suppliers and collaborates with suppliers using information technology that is integrated with suppliers [32]. ERP allows the company to respond quickly and proactively to the company customer requirement to pursue a sustainable supply chain. ERP also enables the company to respond reactively to adjust to the environment. Whereas the company proactively carried out integration with suppliers and customers to achieve company goals [47].

Hypotheses 1 (H1). *Enhanced ERP systems affect supplier integration.*

3.2. Relationship between the Enhance ERP System Concept and Internal Integration

ERP adjustments to the company will provide a company system that is always updated and makes it a source of information used by all company components. The role of ERP is essential in building a company's internal integration using a single database. With internal integration within an organization, managers can use ERP technology to assimilate data from departments throughout the organization [48]. Information technology enables practitioners to search and understand incoming data in real-time and adjust operational settings as needed. Managers can then develop integrated processes to improve the flow of goods and information between various departments and functional areas within an organization [48]. The database used together with the company to provide fast and complete information will facilitate decision-making to minimize supply chain risk, which creates an imbalance between supply and demand. The speed of decision-making for internal integration and external integration is vital for companies to maintain stability in an unstable market [49]. Information sharing built and coordinated among cross-functional departments positively and significantly impacts the logistics services supply chain's integration capability in service providers companies in China [50]. The information technology owned by the ERP companies can increase the external integration, which is built between the companies and their supplier, by sharing real-time data so both parties can adjust their planning and scheduling based on the actual practices [51].

Within an integrated organization, employees utilize information technology to quickly detect inventory and demand levels in overcoming the consequences of various supply chain issues. Internal integration also allows information processing and allows organizations to respond to real risks in the supply chain [52]. Internal integration

enables organizations to connect and coordinate better throughout the company when responding to various supply chain risks [26]. Decision-making quickly, managers must take the initiative to develop an integrative relationship with individuals in using available information technology [49]. The use of information technology can provide balanced information to all company departments to determine the risks faced. Internal integration within the company will enable all departments to access the company's products and monitor its operational processes to reduce its operational performance by increasing its operational performance [32]. Companies use ERP to respond to internal companies to ensure that business processes between the company's functions run well and achieve optimal resources [47].

Hypotheses 2 (H2). *Enhanced ERP systems affect internal integration.*

3.3. Relationship between the Enhanced ERP System Concept and Green Supply Chain Management

ERP system customization ensures that the company has used integrated information technology as a single system. The company's ability to adjust the ERP system impacts paper use, declining, and even eliminating paper usage in its departments. Eco-collaboration with external parties is very beneficial for companies when building plans using integrated information technology [12]. Material flow and integrated information flow in the supply chain will impact the fulfillment of processes or products to corporate customers using information technology to reduce the natural environment's impact [3]. Environmental management practices in building information technology companies can build integration with suppliers and customers to implement green supply chain management [53].

Hypotheses 3 (H3). *Enhanced ERP systems affect green supply chain management in companies.*

3.4. Relationship between the Concept of Internal Integration with Green Supply Chain Management

Internal integration within the company allows exchanging information from one department to another and between employees and employees. The use of information technology increases companies' intensity in sharing information and shows how well organizations communicate critically [39]. Developing competencies with internal integration, sharing information, and training can improve GSCM in organizations. Improvements in the supply chain occur because internal employees and external supply chain partners become better connected to coordinate various organizational policies related to its material inventory and decrease production costs [22]. Internal integration and information technology allow individuals throughout the supply chain to share information about the risks that occur, minimizing the impact of consequences on the supply chain. This internal integration and information technology allow managers to collect, coordinate, and disseminate data about supply chain risks and then use that information to manage the balance between supply and demand. Internal integration enables collaboration across internal boundaries [54] and facilitates interaction while also allowing communication to be carried out quickly. Internal integration by the company can initiate the interaction during the procurement of materials with the suppliers in the global sourcing environment [55].

Hypotheses 4 (H4). *Internal integration affects the green supply chain management.*

3.5. Relationship between Supplier Integration and Green Supply Chain Management

The integration built by the company with external parties can provide environmentally friendly materials and sub-materials. Integration with suppliers provides stability for the company in procuring materials and strengthening its partnership with suppliers. The integration process in supply chain management is reflected in suppliers and buyers [56]. The findings show that there is cognitive consistency about intra-company factors that influence inter-company internal integration activities, which constitute an internal collaborative culture and internal synchronous practices that will influence supplier integration because of the sharing of collaboration attributes synchronization. In this finding, it can be seen that there are results of an investigation into intra-company factors and activities so that it can be a starting point for understanding managerial attitudes towards something

more complex in inter-integration activities within the company [45]. The findings revealed that the integration of customer and supplier integration could positively affect internal integration. So, companies that implement customer and supplier involvement need to increase internal integration in the company. This integration can influence customer involvement in internal integration that is greater than the involvement of integration suppliers alone. This study looks more closely at manufacturing flexibility and internal integration literature to understand the triadic relationship between internal integration, internal flexibility, and external flexibility [57]. Integration with supplier and customer in sharing knowledge improved the company's operational performance [32].

Hypotheses 5 (H5). *Supplier integration affects green supply chain management.*

3.6. Relationship of Supplier Integration with Firm Performance

Internal integration positively influences the organization's ability to improve, both directly and indirectly [28]. Companies must increase supply chain flexibility and develop competencies through internal integration, information sharing, and training to overcome various supply chain risks. With internal integration, companies can coordinate resources to restore the supply chain in stable conditions. Internal integration allows the supply chain of resources to detect various obstacles [26]. A manager can carry out internal integration to identify gaps in the supply chain and communicate information about the affected parties' possible consequences. This information technology helps to review the availability of the company's inventory to know the appropriate supply strategy to avoid the risk of an imbalance in the number of requests with the amount of raw material supply that might occur. When there is an unexpected surge in demand, management utilizes information technology to identify alternative supply sources and replenish needed supplies. Supplier integration enables the company to integrate with suppliers and synchronize planning, production processes, and customer demand. The same concept can be applied to practice as supplier innovation, supplier development, and supplier quality improvement [45]. The trust among shareholders, which is built upon the willingness to cooperate between the companies and their suppliers, will create stronger intensity to collaborate in finding optimal solutions to reduce overall costs and increase profitability [51].

Integration with external parties, especially suppliers, needs to inform the company about the quantity and quality of the material supplied and the constraints faced to inform its customers. This condition will provide good relations for the company and product prices company [33]. Internal integration and knowledge transfer can provide an increase in company performance [58]. The success of supplier integration will provide fast information for companies to increase company performance effectiveness and efficiency [23]. Integration with suppliers enables companies to complement and strengthen human resources so that collaborative partnerships between companies and suppliers occur and enable companies to maximize company performance [32]. The company's ability to build integration with its suppliers can build collaboration to reduce its performance [59]. The information sharing with external partners is carried out in a timely, complete, reliable, and adequate manner, enabling improved retail performance in Australia [60].

Hypotheses 6 (H6). *Supplier integration affects firm performance.*

3.7. Relationship between the Concept of Internal Integration with Firm Performance

The exchange of information in internal integration will create opportunities where optimization can be done by reducing the bullwhip effect and contributing to improved performance [44]. A well-integrated internal business process will improve SCM performance through reducing costs, shortening delivery time, providing appropriate feedback, maintaining low inventory levels, and increasing reliability. Internal integration creates easy access to operational data from integrated databases that connect various departments within the company. Internal integration in products and processes related to knowledge flow positively impacts its operational performance [32].

Internal integration that connects different functions can provide information for the company to be shared with its partners in order to be able to improve the ability of the company's production process [59]. Information technology enables operational effectiveness through superior customer service, efficient operational systems, and more efficient human resource management by creating a competitive advantage. The company's top management in investing in technology projects that integrate internal functions must ensure that they align with its strategic objectives. Managers need to develop relevant performance measures to gain the added advantage of using technology. The supply chain relies on information systems to identify changes in the market, and actions can be determined to deal with market changes by moving facilities, replacing suppliers, and outsourcing. Technology plays a vital role throughout all the supply chain stages to create a competitive advantage and more effective customer service. Internally, by sharing information, the company can build cohesiveness among functions that can increase the logistics services supply chain's integration capability. Thus, it has an impact on supply chain performance [50].

Integrated information technology can create the highest potential in improving operational performance and overall company performance when aligned with its strategic objectives. The company's strategic goal is to provide different products/services for its customers. The use of information technology also allows companies to track buyers' buying habits, determine fluctuations in the sales of seasonal products, and track the impact of marketing by comparing changes in product demand with the marketing style the company has done. Information technology can improve customer service and save inventory costs through collaboration between parts in the supply chain. Supply chain performance is a subset of company performance. Decisions on adoption and use of information technology are based on the supply chain's operational efficiency to improve overall company performance.

Hypotheses 7 (H7). *Internal integration affects firm performance.*

3.8. Relationship between Green Supply Chain Management and Firm Performance

The use of GSCM in manufacturing companies will provide changes to the procurement system, its operational system, and its marketing system to increase its competitiveness. GSCM integrates companies to pay attention to the environment in supply chain flow activities related to product design, material procurement, supplier selection, company manufacturing processes, sending finished products to customers, and the end of products after use [12]. GSCM on green purchasing companies can positively impact operational performance associated with reducing production costs, operating flexibility, and improving quality [3]. GSCM has an impact on the financial performance of 500 top US green companies [61].

Practical green supply chain related to supplier selection and evaluation of material suppliers to the company, vendor managed inventory, investment recovery, eco-design, packaging environment, reverse logistics, and partnership with customers impact manufacturing companies' performance [1]. The company's supply chain collaboration builds with external parties, especially suppliers, impacts company performance [62]. The focus of GSCM is the procurement of environmentally friendly materials that impact the company's business performance related to the provision of products and services [27]. Green purchasing focuses on supplier selection and developing a stable production process. Research in the United States of America manufacturing industry has shown that green supply chain management positively impacts manufacturing companies' environmental and economic performance [16,63]. A similar study has also been performed in Thailand with the companies certified with ISO 14001, and the result indicated that green supply chain management implementation affects the environmental, economic, and intangible performance of the companies [4]. Research by [64] in the Romanian mining entities has shown that firm performance could be improved by optimizing the green business strategy

and emission inventories. Based on the above arguments, the last hypothesis is determined as follow:

Hypotheses 8 (H8). *Green supply chain management affects firm performance in the company.*

Those relationships between every two constructs and the proposed hypothesis, as described previously, are demonstrated in Figure 1.

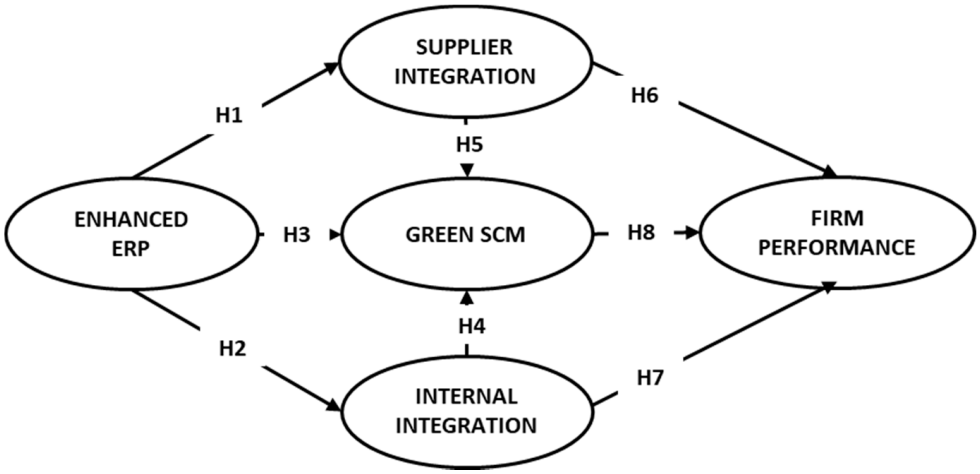

Figure 1. The Proposed Research Model and Related Hypothesis.

4. Research Method

This research concerns the companies that always upgrade their ERP to copy with the on-going business process development called enhanced ERP. The suitability of ERP on an on-going basis improves its internal and external integration, enabling companies to implement the GSCM strategy to improve their performance (Figure 1). This study has surveyed the population of 243 manufacturing companies domiciled in East Java, Indonesia, which have implemented ERP for more than four years. Besides, the selected companies also have been certified with ISO 14,000 in the environmental management system. Data collection used a questionnaire designed with a five-point Likert scale with 1 = strongly disagree up to 5 = strongly agree. One hundred fifty (150) students of operation management assisted the questionnaire distribution, and each student was assigned responsibility for one company. It took three months to collect the questionnaires, and of the 150, 135 questionnaires were returned and considered valid for the analysis. The questionnaires distribution used the google form link and postal mail sent to the company public relation department and then forwarded to the appropriate respondent with the predetermined criteria. The respondent is a supervisor level or higher in charge of IT, production, purchasing, or logistic. The supervisor level or higher in these departments is considered knowledgeable concerning the company operation and policies and understands the study's context

Data analysis of this study used the Partial Least Square (PLS) technique using smart-PLS software version 3.0. Data analysis examines two elements of the model, which are the outer and inner model. The outer model analysis assesses the validity (convergent and discriminant validity) and reliability of the indicators. The outer loading value represents convergent validity, and the cross-loading value represents discriminant validity. At the same time, the inner model analysis examines the predetermined hypotheses. The indicators are considered valid when the outer loading value is greater than 0.5, and the outer loading is greater than the cross-loading value [65]. Table 1 demonstrated the analysis result of outer loading, cross-loading, and the indicator score means value. The score means of the indicator's value is in the range of 3.9030 and 4.3358. This value represented the average score of all responses on each indicator.

Table 1. Test Results of Outer Loading, Cross Loading, and Score Means.

Indicator *	Enhanced ERP	Firm Performance	GSCM	Internal Integration	Supplier Integration	Score Means
EERP1	0.815	0.506	0.535	0.432	0.582	4.0448
EERP2	0.703	0.437	0.446	0.468	0.522	4.1418
EERP3	0.775	0.505	0.455	0.443	0.579	4.2612
EERP4	0.773	0.517	0.586	0.426	0.546	4.0447
EERP5	0.767	0.498	0.555	0.422	0.536	4.0224
FP1	0.568	0.816	0.524	0.442	0.510	4.0149
FP2	0.467	0.774	0.514	0.537	0.453	4.1567
FP3	0.473	0.759	0.483	0.435	0.500	4.2015
FP4	0.374	0.668	0.494	0.478	0.529	4.2388
FP5	0.569	0.700	0.544	0.556	0.578	4.0821
GSCM1	0.515	0.467	0.667	0.455	0.464	4.1343
GSCM2	0.417	0.406	0.701	0.407	0.506	4.1866
GSCM3	0.489	0.583	0.795	0.492	0.450	3.9925
GSCM4	0.441	0.502	0.769	0.460	0.454	4.0149
GSCM5	0.371	0.470	0.721	0.580	0.588	4.1716
In.I1	0.483	0.448	0.470	0.763	0.345	4.0821
In.I2	0.409	0.555	0.413	0.764	0.312	3.9030
In.I3	0.514	0.511	0.409	0.782	0.512	3.9254
In.I4	0.369	0.423	0.354	0.701	0.204	4.0149
In.I5	0.420	0.351	0.405	0.664	0.315	4.0598
S.In1	0.270	0.486	0.392	0.459	0.697	4.0597
S.In2	0.309	0.522	0.459	0.485	0.783	4.0820
S.In3	0.495	0.518	0.488	0.241	0.750	4.1417
S.In4	0.542	0.570	0.565	0.321	0.817	4.1717
S.In5	0.418	0.438	0.401	0.437	0.528	4.3358

Note: * those indicators notation were defined in the literature review section.

The Enhanced ERP variable has the lowest outer loading value of 0.703 for the EERP2 indicator. Hence all indicators of Enhanced ERP are considered valid. The firm Performance indicators obtained the lowest value on FP4 with a value of 0.668, which exceeds 0.5, so that all indicators on Firm Performance are valid. GSCM has the lowest value for GSCM1 with a value of 0.667; hence, all the indicators are valid. Similarly, the internal integration has the lowest value for the In.I5 indicator at 0.664 and above 0.5. The Supplier Integration also indicated that all its indicators have outer loading values greater than 0.5. Besides the validity, the outer model also assesses the reliability of each variable's block of indicators. The reliability is assessed using the Cronbach's Alpha, rho_A, composite reliability with the minimum acceptable value of 0.70, and AVE with the minimum acceptable value of 0.5 [65]. Table 2 demonstrated that all the values are greater than the minimum value; hence all indicators are considered valid and reliable. Since the outer model is considered valid and reliable, further analysis for the hypothesis testing is allowed. Table 2 also indicated the value of R^2. The value of R^2 is moderately between 0.325 and 0.675. This result shows that each dependent variable's variance: firm performance, GSCM, internal integration, and supplier integration is moderately explained by its independent variable, respectively.

Table 2. Test Results of Reliability and R^2

Variable's	Cronbach's Alpha	rho_A	Composite Reliability	AVE	R^2
Enhanced ERP	0.825	0.826	0.877	0.589	-
Firm Performance	0.798	0.800	0.861	0.555	0.675
GSCM	0.782	0.784	0.852	0.536	0.514
Internal Integration	0.788	0.794	0.855	0.542	0.325
Supplier Integration	0.761	0.769	0.842	0.521	0.520

5. Research Discussion and Analysis

5.1. Characteristics of Respondents

Objects in this study are manufacturing companies in East Java, Indonesia. Research respondents work at the company with a minimum of four years of work experience to understand and experience the company where the employee works and the company's system. Distribution of questionnaires given to companies with the criteria of the total workforce found 43 companies had a workforce of fewer than 50 people, 16 companies had a workforce of more than 50 workers and less than 100 people, 13 companies had a workforce of more than 100 and less than 200 workers employment and companies that have a workforce of more than 200 totaling 63 companies. Based on the type of enhanced ERP system used, it was found that 35 companies used ERP SAP R/3, ten companies used Oracle, one company used BAAN, three companies used MFG Pro, one company used JD Edwards, eight companies used People Soft, and 77 The company develops its ERP system following the needs and capital of the company. Companies in East Java have implemented ERP, especially in developing ERP systems due to the company.

According to the company functions and integration, the ERP system self-development is designed according to key users and ERP end-users needs. The use of ERP for companies is essential and becomes a system that companies use together. The use of ERP in a company can be seen from the length of ERP implementation. Based on the ERP experience, 27 companies used it for four years, 24 companies for five years, 14 companies for six years, 12 companies for seven to eight years, 23 companies for nine to ten years. In general, all the samples have used the ERP for the long term and become a single system that needs to be adjusted according to the function, and ERP called enhanced ERP. This finding shows that the respondent's departmental companies already have information systems integration, and most of them are integrations that are developed by themselves to suit the systems in their respective companies.

Characteristics of respondents based on departments in companies that use ERP System shows that the highest number of ERP systems in a row is found in the Marketing and Production section. Based on Table 3, it is found that almost all departments have used ERP system as a function in their department and integration between functions. This result shows that the respondents in this study were respondents from key departments in supply chain management activities.

5.2. Hypothesis Test Results

The value of the path coefficient or inner model shows the level of significance in hypothesis testing. The coefficient score is the path indicated by T-statistics. Hypothesis testing is significant if the T-Statistic value is more than 1.96 with a significance level (p-Value) of 5% or 0.05. The iteration results obtained from the Smart PLS program also produce values original sample, the sample means, and standard deviation [65]. The original sample is a beta score unstandardized used to see the dependent variable's independent variable predictive nature. The sample mean is the average value of the sample generated from the iteration process. Standard deviation is a standard error.

The path coefficient analysis results in Table 4 and Figure 2 show the value of the path coefficient and the T-statistic value to verify and determine the hypotheses' significance. The result found that all hypotheses are empirically supported. Enhanced ERP affects firm performance, enhanced ERP influences GSCM, enhanced ERP impact internal integration, Enhanced ERP of supplier integration, GSCM against firm performance, internal integration of firm performance, internal integration of GSCM, supplier integration of firm performance, and supplier integration of GSCM. Table 4 shows the results of the calculations path coefficient using the Smart PLS program [66].

Table 3. Characteristics of Respondents by Department.

No.	Department	Number	Percentage
1	Accounting	11	8%
2	Marketing	28	21%
3	PPIC	4	3%
5	Production	22	16%
6	Finance	12	9%
7	Sales	7	5%
8	General	13	10%
9	Purchasing	9	7%
10	SCM Department	9	7%
11	Human Resources Department	6	4%
12	Material Management	6	4%
13	Engineering	5	4%
14	IT Department	3	2%
	Total	135	100%

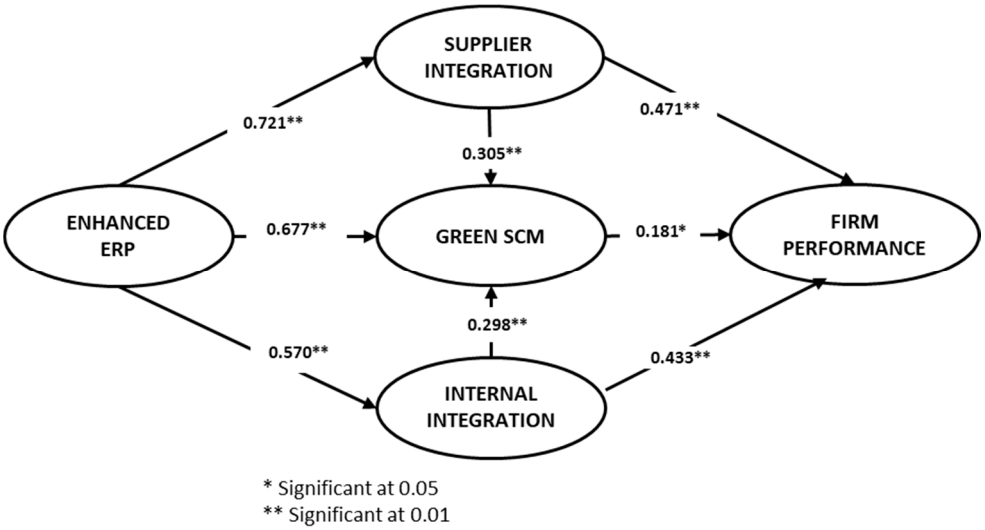

Figure 2. Research Model with the Path Coefficient.

Table 4. Test Results of Direct Effect Relationship.

Relationship	Original Sample (O)	(ST.DEV)	T Statistics	*p* Values
Enhanced ERP → Supplier Integration (H1)	0.721	0.046	15.556	0.000
Enhanced ERP → Internal Integration (H2)	0.570	0.053	10.798	0.000
Enhanced ERP →GSCM (H3)	0.677	0.045	5.128	0.000
Internal Integration → GSCM (H4)	0.298	0.081	3.687	0.000
Supplier Integration → GSCM (H5)	0.305	0.086	3.524	0.000
Supplier Integration → Firm Performance (H6)	0.471	0.058	8.154	0.000
Internal Integration → Firm Performance (H7)	0.443	0.060	7.373	0.000
GSCM → Firm Performance (H8)	0.181	0.076	2.476	0.013

Based on Figure 2 and Table 4, the Enhanced ERP effect on GSCM obtained a path coefficient of 0.674 with t-statistics 15.128 and a *p*-value of 0.00. This finding shows a significant positive effect between Enhanced ERP on GSCM in East Java manufacturing companies. The adjustment of Enhanced ERP will impact the implementation of GSCM in manufacturing companies. The study results indicated that manufacturing companies in East Java have maintained and developed the ERP system appropriate to the company's needs, end-user, and critical user and contributes to adopting green manufacturing practices.

The companies have also developed the ERP system to comply with the environmentally friendly production system to pursue sustainable company's business. This study supports Al-Ghwayeen and Abdallah's results [12], which states that companies' integration with external parties can provide good eco-collaboration. This result supported the research results by [3] that internal integration in the company can support products' fulfillment in a natural environment [3].

The enhanced ERP hypothesis on internal integration obtained a path coefficient of 0.570 with a t-statistic of 10.798 and a *p*-value of 0.00. This result indicates a significant positive effect between Enhanced ERP on internal integration in East Java manufacturing companies. That is, the adjustment of Enhanced ERP will have an impact on internal integration between functions in the department in manufacturing companies in East Java. ERP system integrates data between departments wholly and accurately and allows the departments to establish secure communication, coordination, and collaboration. The integration of related departments supports decision-making, such as the level of inventory. This study supports the research results by Demeter et al. [32], which stated that internal integration within the company enables all departments to access product availability and monitor operational processes.

The enhanced ERP hypothesis towards supplier integration obtained a path coefficient of 0.721, a t-statistic of 15.566, and a *p*-Value of 0. This result indicates a significant positive effect between Enhanced ERP on supplier integration in East Java manufacturing companies. This finding means that an enhanced ERP adjustment will impact sharing information between suppliers and manufacturing companies in East Java. The ERP system integrates the required data between suppliers and the company. When suppliers understand the company requirement, then coordination and collaboration can be settled based on the cooperation. This data integration enables information sharing and creates a mutual partnership between the two parties. This study supports the statement that its ERP system can impact collaboration with its suppliers [22]. Data integration within the company can integrate with the company's external partners [33]. This study also supports which states that ERP technology can establish integration with suppliers in coordinating planning and production processes [45].

GSCM affects the firm performance with a path coefficient of 0.188, a t-statistic of 2.476, and a *p*-Value of 0.013. This result shows a significant favorable influence of GSCM on manufacturing companies' firm performance. The implementation of GSCM will have an impact on firm performance in manufacturing companies in East Java. The company conducted GSCM practices through the implementation of green purchasing and green manufacturing. The green supply chain management practices improved the company's performance by improving the quality and decreasing the production costs. This study confirmed that GSCM research provides quality products that fit customers' needs [12]. GSCM positively impacts operational performance due to reduced production costs and improved quality [3]. This study also supports Wang and Sarkis [61] and Appolloni et al. [16], which states that GSCM can increase company performance.

The hypothesis of internal integration on the firm performance obtained a path coefficient of 0.443 with a t-statistic of 7.373 and *p*-Value 0. This result indicates a significant positive effect on the internal integration of firm performance in East Java's manufacturing companies. This finding implies that internal integration affects the company against firm performance of manufacturing companies in East Java. Internal integration in manufacturing companies enables all related departments to establish a joint decision supported by all departments. Joint decision-making is possible such as in reducing lead time and production costs. This study supports the states that internal integration impacts the company's operational performance [32].

The effect of internal integration on GSCM implementation has a path coefficient of 0.298, a t-statistic of 3.687, and a *p*-value of 0.00. This finding indicates a significant positive effect of the internal integration on GSCM. Internal integration between functions within the company provides an increase in GSCM implementation in manufacturing companies

in East Java. Internal integration allows the management to make a joint decision involving all related departments in setting the company goals and policies to be achieved, including management decisions regarding using the green product. This research supports the results, stating that the internal integration between functions built by the company can increase its supply chain strategy [25].

The supplier integration influences the firm performance with a path coefficient of 0.469, a t-statistic of 8.154, and a *p*-value of 0.00. This finding indicates a significant positive effect between supplier integration on East Java's manufacturing companies' firm performance. The existence of supplier integration between suppliers and companies increases firm performance in manufacturing companies in East Java. The integration with the supplier requires communication, coordination, and collaboration that allows both parties to share innovative ideas. The innovation provides an improvement such as a reduced production cost, inventory cost, and firm performance. This research is in line with research that states that supplier integration by collaboration can reduce waste and efficiency as one of the company's goals [25]. State that the company's information sharing with partners in a timely, complete, reliable, and adequate manner can provide performance improvements for retail companies related to inventory costs, labor costs, transportation costs, operation costs, waste costs, and high profit [60].

The result indicated that supplier integration influences GSCM with a path coefficient of 0.305, a t-statistic of 3.524, and a *p*-value of 0.00. This result indicates a significant positive effect on supplier integration of GSCM in manufacturing companies in East Java. The existence of supplier integration between suppliers with the company increases GSCM implementation in East Java manufacturing companies. The company established an integration system for sharing ideas and information with suppliers and enhancing better collaboration to build a partnership with the suppliers, particularly in material procurement that complies with the environmentally friendly requirement. The partnerships that companies build with suppliers contribute to company sustainability in the future.

Table 5 indicated enhanced ERP indirect effect on firm performance with a path coefficient of 0.644, a t-statistic of 17.059, and a *p*-value of 0.00. The enhanced ERP positively influences firm performance through the mediating role of supplier integration, internal integration, and GSCM adoption. Besides, the internal integration also indirectly affects the performance through the mediating role of GSCM as the t-value of 2.05 > 1.96. Moreover, supplier integration indirectly affects firm performance through GSCM with a t value of 1.967. These results proved that ERP enhancement could improve the firm performance for the manufacturing companies. This study supports the previous study results stating that the enhanced ERP that suits the organization's needs can increase company performance and provide satisfaction for the users [34]. This study's central issue is green supply management (GSCM) adoption and firm performance. These findings demonstrated that the green supply chain management (GSCM) adoption improves firm performance with the requirement that the company also enhances its ERP, establishes an internal integration and supplier integration. The practice of the GSCM requires full support from the supplier and internal function to make sure the success of the GSCM.

Table 5. Test Results of Indirect Effect of Variables

Indirect Effect of Variable	Original Sample	ST.DEV	T Statistics	*p* Values
Enhanced ERP → firm performance	0.644	0.038	17.059	0.000
Internal integration → firm performance	0.056	0.027	2.067	0.039
Supplier integration → firm performance	0.057	0.029	1.967	0.049

Data integration using ERP technology such as sales forecasting, production planning, production systems, human resources management, accounting management, finance, purchasing, and warehousing enables the organization to formulate better company strategies [8]. ERP is one of the most sophisticated systems that can integrate all departments in communication and information sharing [36].

6. Conclusions

The purpose of this study was to examine the impact of enhanced enterprise resource planning (ERP) on firm performance through supplier integration, internal integration, and green supply chain management. For this purpose, eight hypotheses have been proposed, and the result revealed that those hypotheses were empirically supported. Enhanced ERP systems affect supplier integration, internal integration, and GSCM. Internal integration and supplier integration influence green supply chain management and firm performance. Green supply chain management affects firm performance in the company. These findings supported the previous studies referred to in the formulation of the eight hypotheses. This study contributes to this important finding on the presence of the mediating role of the intervening variable. As shown on the indirect effect test result, the findings prove that enhanced ERP, supplier integration, and internal integration indirectly improve firm performance through the green supplier chain management's mediating role. This finding proved that green supply chain management, one of the recent trending issues resulting from the warming world due to the increasing level of pollution and forest damage, improves firm performance with the support from the supplier and internal function.

In line with the result and this research covers only the supplier and internal integration, this study has revealed the related issue to be a potential for new research by involving the customer demand change in the future. People are becoming more aware of the environmental issue as indicated by the mandatory requirement that the company trading in the global market should be certified with ISO standard in the environmental management system. This study provides a new insight for the manager that adopting green supply chain management contributes to the firm's performance with the support from the supplier and internal function and regular enhancement of the ERP following the business process development. This study also contributes to the on-going research in the field of supply chain management.

The limitation of this paper lies in the research population and the variables involved. The suggestion for further study might deal with variables most related to the pandemic, such as supply chain risk management and customer relationship management, to cover broader parties and functions involved in the supply chain network. Also, the next study might consider different industries such as the service industry instead of the manufacturing industry. Besides, this paper has a limited sample of manufacturing companies domiciled in East Java, Indonesia, which is not adequate to cover Indonesia.

This study might positively impact environmental sustainability since it has promoted the green environment approach. This approach may provide a positive impact on social life in the long term. Also, people would take care of this approach, making it one of the criteria when deciding to use the product.

Author Contributions: Z.J.H.T. prepare the original manuscript, background of research, literature review, conceptual model, methodology, and descriptive statistics; H.S. using software P.L.S., validation, reliability analysis, and hypothesis analysis; F.J., supervision, correcting writing errors, prepare discussion and conclusion, final article and final analysis. All authors have read and agreed to the published version of the manuscript.

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Data Availability Statement: The data presented in this study are available on request from the corresponding author. The data are not publicly available due to request from the respondents.

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Conflicts of Interest: The authors declare no conflict of interest.

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